Vol. 937 Number 2

OFFICIAL GAZETTE

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UNITED STATES PATENT AND TRADEMARK OFFICE

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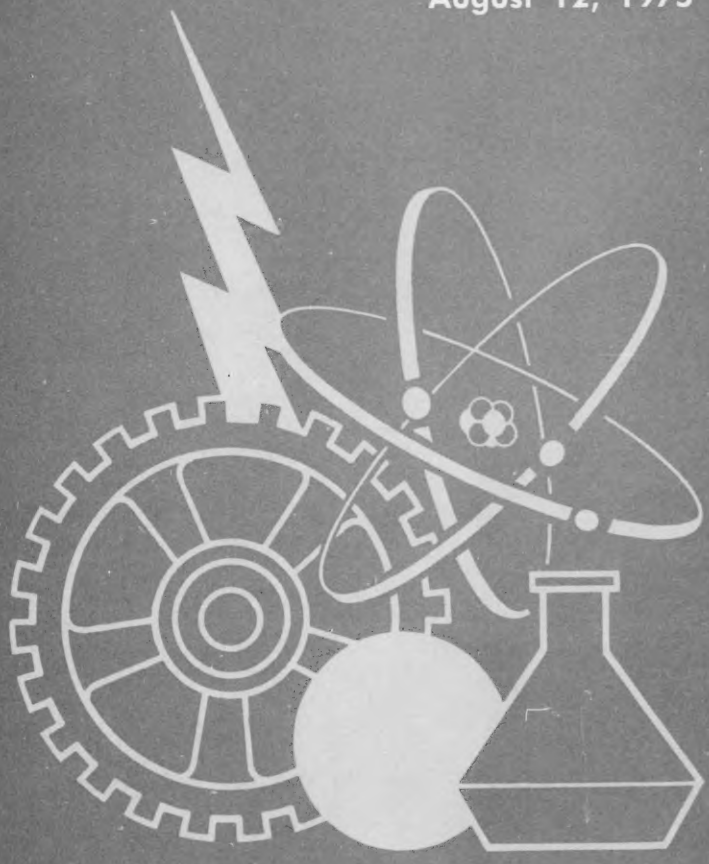

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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

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The U.S. Patent and Trademark Office is establishing the following contingency plan for filing any paper or paying any fee in the Office in the event of an emergency caused by any major interruption in the mail service in the United States. Upon determination by the Commissioner of Patents and Trademarks that such an emergency exists, a notice activating the plan will be issued by the Commissioner. The activating notice will be published in the Wall Street Journal and made available in a special recorded telephone message at area code 703, 557–3158. Also, certain publications, patent bar groups, and other organizations closely associated with the patent system, will be notified. Termination of the program will be similarly announced. Where the postal emergency is not nationwide, the Commissioner will designate the areas of the United States in which the procedures outlined below will be in effect.

U.S. Department of Commerce District Offices (formerly referred to as Department of Commerce Field Offices) will be designated on an emergency basis, as receiving stations for filing papers and paying fees in the U.S. Patent and Trademark Office.

Upon determination that an emergency exists, the following procedures may be followed: All papers and fees should be enclosed in a sealed envelope addressed to the Patent and Trademark Office and deposited in one of the District Offices. Such papers will be considered as received in the U.S. Patent and Trademark Office on the day of deposit. The District Office will date stamp each envelope and the accompanying receipt card which completely identifies the deposited papers. The receipt card will be returned to the depositor. Applicants or their representatives should assure the legibility of the date stamp.

District Office deposits should be limited to checks in payment of issue fees, new application papers wherein priority dates or statutory bars may be involved, amendments where the six month statutory period for response is about to expire, trademark oppositions, Section 8 affidavits, trademark renewals, and to other papers for which the patent and trademark statutes do not provide a remedy for failure to obtain a particular date.

Where papers originate from overseas, it is suggested that the papers be mailed to a registered agent in Canada, with a request that the papers be forwarded by courier to the nearest District Office in the United States.

In regard to pending applications, if the time for taking any action or paying any fee expires during the period that the Commissioner declares to be an emergency, the time will be extended until one month after the end of the emergency period, provided that such extension does not exceed the maximum period for response provided for in the statutes.

Since this extension of time will be automatic, there will be no record in the individual files to indicate that a response filed during the extended period is in fact timely. In order to provide a complete record, applicants or their representatives should file a paper referring to this notice in each case in which a response is filed during the extended period.

The addresses of the Department of Commerce District Offices, subject to subsequent changes, are as follows:

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ATLANTA, 30309, Suite 523, 1401 Peachtree St., NE. (404) 526–6000.

BALTIMORE, 21202, 415 U.S. Customhouse, Gay and Lombard Sts. (301) 962–3560.

BIRMINGHAM, ALA., 35205, Suite 200–201, 908 S. 20th St. (205) 325–3327.

BOSTON, 02116, 10th Floor, 441 Stuart St. (617) 223–2312.

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CHEYENNE, WYO., 82001, 6022 O'Mahoney Federal Center, 2120 Capitol Ave. (307) 778–2151.

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DETROIT, 48226, 445 Federal Bldg. (313) 226–3650.

GREENSBORO, N.C., 27402, 203 Federal Bldg., W. Market St., P.O. Box 1950. (919) 275–9111, Ext. 345.

HARTFORD, CONN. 06103, Room 610–B, Federal Office Bldg., 450 Main St. (203) 244–3530.

HONOLULU, 96813, 286 Alexander Young Bldg., 1015 Bishop St. (808) 546–8694.

HOUSTON, 77002, 201 Fannin, 1017 Federal Office Bldg. (713) 226–4231.

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NEW ORLEANS, 70130, Room 432, International Trade Mart, 2 Canal St. (504) 589–6546.

NEW YORK, 10007, 41st Floor, Federal Office Bldg., 26 Federal Plaza, Foley Sq. (212) 264–0634.

NEWARK, N.J., 07102, Gateway Bldg., (4th floor) (201) 645–6214.

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ST. LOUIS, 63105, Chromalloy Bldg., 120 S. Central Ave. (314) 622–4243.

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SAN FRANCISCO, 94102, Federal Bldg., Box 36013, 450 Golden Gate Ave., (415) 556–5860.

SAN JUAN, P.R., 00902, Room 100, Post Office Bldg. (809) 723–4640.

SAVANNAH, 31402, 235 U.S. Courthouse and Post Office Bldg., 125–29 Bull St. (912) 232–4204.

SEATTLE, 98109, 706 Lake Union Bldg., 1700 Westlake Ave. North (206) 442–5615.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

July 18, 1975.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,876,985, Birchall, Jr. and Purdy, ROTARY VALVES FOR LABORATORY GLASSWARE AND THE LIKE, **filed** Feb. 26, 1975, D.C.N.J. (Camden), Doc. 75–0339, *Fischer & Porter Company* v. *Kontes Glass Company, Inc.*

2,895,803, J. S. Spevack, ISOTOPE CONCENTRATION SYSTEM; **3,142,540**, same, APPARATUS FOR DUAL TEMPERATURE EXCHANGE, **filed** July 20, 1965 (District of Columbia), Court of Claims, Doc. 240–65, 302–65 and 515–71, *Jerome S. Spevack and Deuterium Corporation* v. *The United States.* Order that judgment be entered for plaintiffs, June 28, 1974.

3,055,988, B. B. Bauer, MAGNETIC PHONOGRAPH PICKUP; **3,077,521,** Ahrens, Kuhn, Richter, STEREOPHONIC MOVING MAGNET PHONOGRAPH PICKUP; **3,077,522,** Gunter, Anderson, STEREOPHONIC PICKUP CARTRIDGE, **filed** Aug. 29, 1974, D.C., S.D. Fla. (Miami), Doc. 74–1092–C–JE, *Shure Brothers Inc.* v. *Walder Electronic Distributors Co.* Defendant is hereby permanently enjoined from infringing plaintiff's patent directly or indirectly, Jan. 27, 1975.

3,069,608, Forrester, Pease, McDonough and Susskind, CONTROL SYSTEM, **filed** Feb. 27, 1975, D.C., S.D. Mich. (Detroit), Doc. 70350, *The Bendix Corporation* v. *The Superior Electric Company.*

3,134,583, R. W. Wilson, APPARATUS FOR BULK CURING TOBACCO; **3,244,445,** same, APPARATUS FOR SUPPORTING TOBACCO LEAVES IN BULK FORM FOR CURING, **filed** Apr. 1, 1974, D.C., M.D. Fla. (Jacksonville), Doc. 74–221–C–J–T, *Powell Manufacturing Company, Inc.* v. *Live Oak Gas Company.* Final judgment for plaintiff, Dec. 30, 1974. **Same, filed** Feb. 25, 1974, D.C., M.D. Fla. (Jacksonville), Doc. 74–124–C–J–R, *Powell Manufacturing Company Inc.* v. *Suwannee Valley Gas, Inc.* Final judgment for plaintiff, Dec. 30, 1974.

3,142,540. (See 2,895,803.)

3,164,350, R. H. Taub, MERCHANDISE DISPLAY STAND, **filed** Mar. 3, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c689, *Melvin Pollack et al.* v. *Pace Promotions, Inc. et al.*

3,174,752, P. Plentis, SHUFFLE BOARD GAME DEVICE, **filed** Mar. 17, 1975, D.C., E.D. Mich. (Detroit), Doc. 75–70468, *Milton Bradley Co.* v. *Peter Plentis.*

3,178,618, S. R. Causey, ELECTRIC TERMINAL AND CONTROL BOX, **filed** Mar. 5, 1975, D.C., E.D. Mo. (St. Louis), Doc. 75–210C(4), *Stanley R. Causey* v. *General Electric Company.*

3,218,048, Smith and Hartwell, PACKING FOR FRACTIONATING COLUMN AND THE LIKE, **filed** May 17, 1972, D.C.N.J. (Newark), Doc. C862–72, *Metax Corporation* v. *Chem-Pro Equipment Corp.* Stipulation and order of dismissal of action, Mar. 27, 1975.

3,244,445. (See 3,134,583.)

3,250,847, H. C. Chamberlin, MUSICAL INSTRUMENT WITH RECORD TYPE TONE GENERATOR; **3,749,808,** C. S. Nelson, Jr., LOW DISTORTION OPTICAL ORGAN, **filed** May 30, 1974, D.C.N.J. (Newark), Doc. C–74–792, *Opsonar Organ Corporation* v. *General Electro Music, Inc.* Consent judgment for permanent injunction, Sept. 26, 1974.

3,308,491, W. R. Spence, CUSHION STRUCTURE, **filed** Oct. 13, 1970, D.C., S.D.N.Y., Doc. 70–C–4470, *Stryker Corp.* v. *Ortho Industries, Inc.* Judgment entered Apr. 8, 1971.

3,321,027, Johnson, Frase and Morkoski, SELF-RESTORING PLOW TRIP, **filed** Mar. 27, 1975, D.C., S.D. Ill. (Peoria), Doc. RI–C–75–6, *International Harvester Company* v. *Deere and Company.*

3,325,411, F. N. Stepanek, Jr., COMPOSITIONS CONTAINING CHLORINATED ISOCYANURATES AND METHODS FOR STABILIZING AND TABLETTING THE SAME, **filed** Oct. 2, 1974, D.C., S.D. Fla. (Fort Lauderdale), Doc. (FL)74–300–C–WM, *Aspen Industries, Inc.* v. *Chem Lab Products, Inc.*

3,459,199, J. F. Connell, TEASING AND UNSNARLING IMPLEMENT, **filed** Mar. 27, 1975, D.C., N.D. Ga. (Atlanta), Doc. C75–570A, *Jerry F. Connell, Gary F. Burns and Conelco, Inc.* v. *Clairol, Inc.*

3,462,858, F. W. Francklyn, SHELLFISH HARVESTING MACHINE, **filed** Mar. 27, 1975, D.C., W.D. Wash. (Seattle), Doc. C75–215–S, *Gilbert W. Francklyn* v. *Guilford Packing Company.*

3,512,923, Dixon and Coppock, DRY CLEANING PROCESS, **filed** Sept. 23, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74–2757–WPG, *Peter R. Dixon et al.* v. *J. C. Penney Co., Inc.*

3,514,074, R. E. Self, HIGH ENERGY LOSS FLUID CONTROL, **filed** Mar. 21, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–1012–R, *Richard E. Self* v. *Atlantic Richfield Co. and Chanslor-Western Oil & Dev. Co.*

3,552,469, L. M. Corless, TIRE BEAD SEATER; **3,675,705,** same, TIRE BEAD SEATING AND INFLATION APPARATUS; **3,805,871,** same, TIRE MOUNTING, BEAD SEATING AND INFLATION APPARATUS AND METHOD OF USE, **filed** Feb. 6, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c402, *B and J Manufacturing Co.* v. *Royal Industries and Rubber Inc.* **Same, filed** Feb. 6, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c401, *B & J Manufacturing Company* v. *FMC Corporation.*

3,619,381, G. R. Fitterer, DETERMINING OXYGEN CONTENT OF MATERIALS; **3,752,753,** same, METHOD OF FABRICATING A SENSOR FOR THE DETERMINATION OF THE OXYGEN CONTENT OF LIQUID METALS; **3,773,641,** same, MEANS FOR DETERMINING THE OXYGEN CONTENT OF LIQUID METALS, **filed** Feb. 22, 1973, D.C., W.D. Pa. (Pittsburgh), Doc. 74–183, *Fitterer Engineering Assoc. Inc. and Dr. George R. Fitterer* v. *United States Steel Corp. et al.* Defendants have infringed on patents up to Jan. 1, 1975, case amicably settled thereafter, Feb. 27, 1975.

3,631,686, F. A. Kautz, MULTIZONE AIR-CONDITIONING SYSTEM WITH REHEAT, **filed** Apr. 8, 1975, D.C. Del. (Wilmington), Doc. 75–90, *International Telephone and Telegraph Corp.* v. *American Air Filter Company, Inc.*

3,650,427, E. Franklin, TWO PIECE DOUBLE WALLED CONTAINER, **filed** Mar. 7, 1975, D.C., S.D.N.Y., Doc. 75–C–1154, *Calumet Mfg. Co., Inc.* v. *Ethyl Corporation.*

3,655,173, B. J. Costello, CONVEYOR FOR FUSING AND HEATING SYSTEMS, **filed** Jan. 24, 1973, D.C.N.J. (Trenton), Doc. 100–73, *Spectra Instruments, Inc.* v. *Argus Engineering Co., Inc.*

3,675,705. (See 3,552,469.)

3,742,908, D. H. Merino, ANIMAL HABITAT, **filed** Apr. 1, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c1037, *Mattel, Inc.* v. *Pets International Ltd. Inc. and Genyk Products Limited.*

3,749,808. (See 3,250,847.)

3,752,753. (See 3,619,381.)

3,773,641. (See 3,619,381.)

3,802,373, R. E. Lagerquist, ENCAPSULATING SLEEVE FOR HEADSTAY OF A SAILBOAT, **filed** Mar. 19, 1975, D.C. Md. (Baltimore), Doc. Y–75–325, *Rolf E. Lagerquist* v. *Hood Sailmakers, Inc. and Hood Yacht Systems.*

3,805,871. (See 3,552,469.)

3,811,453, C. Bretton, METHOD AND MEANS FOR ATTACHING A HAIR SUPPLEMENT, **filed** Apr. 4, 1975, D.C. Minn. (St. Paul), Doc. 4–75–C–149, *Allen Arthur, Inc., doing business as DK Studios* v. *Monte Carlo Hair Piece Co., also known as Monte Carlo Hairpieces, Inc.*

3,827,554, J. W. Richard, BEAN SIZER AND BROKEN BEAN ELIMINATOR, **filed** Apr. 4, 1975, D.C., S.D. Fla. (Miami), Doc. 75–514–C–WM, *James W. Richard and Conveyor Line Products Corp.* v. *American Conveyor Corporation.*

3,841,231, E. J. Hlinsky, SIDE FRAME KEY FOR AN AXLE BEARING ASSEMBLY IN A RAILWAY TRUCK, **filed** Mar. 12, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c0790, *MacLean-Fogg Lock Nut Company* v. *R. W. Mac Company and Robert W. MacDonnell.*

3,842,561, M. Wong, ADJUSTABLE CEILING STRUT, **filed** Mar. 21, 1975, D.C., N.D. Calif (San Francisco), Doc. C–75–0556–RFP, *Mynin Wong* v. *Carlos Interior Systems, Inc.*

3,844,158, F. W. Mercer, MOBILE MUFFLER SHOP, **filed** Mar. 3, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–779–R, *American Machine & Hydraulics, Inc.* v. *Floyd W. Mercer, doing business as Wholesale Brake Supply.*

3,845,349, T. Liebman, LINE SYNCHRONIZED STROBE LIGHT, **filed** Feb. 25, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV 75–625–AAH, *Theodore Liebman et al.* v. *American Lighting Specialties.*

3,852,790, J. A. Robinson, UNIVERSAL MOUNT FOR ELECTRONIC FLASH UNIT, **filed** Mar. 20, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c923, *Acme-Lite Manufacturing Co.* v. *International Telephone & Telegraph Corp.*

Re. 25,360, E. G. Rice, COMBINATION STOCKINGS AND PANTY, **filed** Mar. 21, 1975, D.C., W.D.N.C. (Charlotte), Doc. C–C–75–78, *Tights, Inc.* v. *Brevoni Hosiery Corporation (formerly Schulte & Dieckhoff (USA), Inc.).*

Certificates of Correction for the Week of Aug. 12, 1975

Re. 28,304	3,859,313	3,879,423	3,884,710
3,382,704	3,860,525	3,879,434	3,884,754
3,657,242	3,861,351	3,880,004	3,884,915
3,729,409	3,863,375	3,880,498	3,884,958
3,773,571	3,863,781	3,880,595	3,884,971
3,775,055	3,864,495	3,880,843	3,885,062
3,782,319	3,865,156	3,880,988	3,885,175
3,785,787	3,865,259	3,881,014	3,885,296
3,803,326	3,867,094	3,881,185	3,885,395
3,808,205	3,867,951	3,881,599	3,885,398
3,818,113	3,868,832	3,881,632	3,885,454
3,821,134	3,869,719	3,881,654	3,885,483
3,822,872	3,871,337	3,881,919	3,885,507
3,822,926	3,872,543	3,882,032	3,885,570
3,826,609	3,873,303	3,882,037	3,885,580
3,829,340	3,873,433	3,882,155	3,885,603
3,836,526	3,873,537	3,882,223	3,885,604
3,836,608	3,875,070	3,882,618	3,885,646
3,837,147	3,875,375	3,882,734	3,885,755
3,839,408	3,875,955	3,882,742	3,885,804
3,840,136	3,875,984	3,882,888	3,885,949
3,843,977	3,876,181	3,883,038	3,885,954
3,844,766	3,876,195	3,883,202	3,886,106
3,845,277	3,876,822	3,883,219	3,886,203
3,846,827	3,876,959	3,883,369	3,886,275
3,849,479	3,877,102	3,883,387	3,886,451
3,849,997	3,877,139	3,883,493	3,886,455
3,852,289	3,877,305	3,883,542	3,886,523
3,852,370	3,877,386	3,883,651	3,886,952
3,853,952	3,877,706	3,883,740	3,887,018
3,854,940	3,877,947	3,883,828	3,887,069
3,855,091	3,878,201	3,884,014	3,887,213
3,855,143	3,878,222	3,884,025	3,887,442
3,855,527	3,878,247	3,884,027	3,887,966
3,855,776	3,878,331	3,884,088	3,888,275
3,856,587	3,878,347	3,884,154	3,888,283
3,856,783	3,878,477	3,884,247	3,888,462
3,856,847	3,878,571	3,884,356	3,888,463
3,857,399	3,878,575	3,884,435	3,888,472
3,857,888	3,878,765	3,884,447	3,888,558
3,858,402	3,878,985	3,884,481	3,890,532
3,858,473	3,879,139	3,884,515	
3,858,553	3,879,172	3,884,663	
3,859,277	3,879,419	3,884,694	

Patents Available for Licensing or Sale

D. 234,997. CUP-SAUCER ASH TRAY COMBINATION. James Stampley, 129 Swaab St., Las Vegas, Nev., 89110.

3,648,746. MAG RIM ADAPTER. Clayton Beamon, P.O. Box 371, Wilson, N.C., 27893.

3,817,401. SELF-PROPELLED DURAL-JACK HOIST. Clifford E. Becker, 817 Camellia Drive, Paradise, Calif., 95969.

3,864,365. CARBONIC ACID DERIVATIVES OF ESTRADIOL AND PROCESSES OF THEIR PRODUCTION. Veb Jenapharm, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y. 10017.

3,866,992. WRITING UTENSIL. A. W. Faber-Castell, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,884,191. ANIMAL BATHING AND DRYING APPARATUS. Pansy M. Stout, 206 Christine Drive, Sacramento, Calif., 95815.

3,875,604. SHOWER BACK SCRUBBER. Isadore T. Wurn, 436 Ruddiman Drive, Muskegon, Mich., 49445.

3,875,951. CASE FOR A COMB. Lung Shin Yang, Taiwan. Correspondence to: Millen, Raptes & White, 1911 Jefferson Davis Highway, Arlington, Va., 22202.

3,879,762. INVALID'S APRON AND BIB. Evelyn L. Herman, 7009 Lower Grove Lane, House Springs, Mo., 63051.

3,878,634. THE TWIN HOOKERS—FLOATING FISHING DEVICE. Jacob R. Quimpo, 3406 Mt. Aachen Ave., San Diego, Calif., 92111.

3,885,247. SELF-ADHERING GARMENT PROTECTOR OR SURGICAL DRESSING WITH SCHERING ACTION. Rosemary J. Kost, 8231 Broadmoor Road, Mentor, Ohio, 44060.

3,888,034. ADJUSTABLE FISHING POLE HOLDER. Kenneth G. McGuire, 5010 Sorento Road, Sacramento, Calif., 95835.

3,888,324. ELECTRIC VEHICLE. Robert G. Kossow, 4941 62nd St., Sacramento, Calif., 95820.

3,888,642. STEAM DUST SCRUBBER ATTACHMENT FOR EXHAUST STOCK. James Toyama, 1980 Cedar Ave., Long Beach, Calif., 90806.

3,892,348. FOLDING CONTAINER. Benedikt Rohner, assignee, Neher A. G. Switzerland. Correspondence to: Oblin, Fisher, Spivak, McClelland & Maier, Cristal Square Five-Suite 400, 1755 S. Jefferson Davis Hwy., Arlington, Va., 22202.

The following 13 patents are offered by: Peter T. Rado, Ide & Haigney, 41 E. 42nd St., New York, N.Y., 10017.

3,029,473. VACUUM POST-CURING OF INFUSIBLE PLASTIC MATERIAL.

3,038,551. SELF-DAMPING MATERIAL AND SONAR DOME FORMED THEREFROM.

3,095,336. HIGH STRENGTH CERAMIC COMPOSITIONS AND METHODS FOR PREPARING THE SAME.

3,123,176. SONAR DOME.

3,136,380. SONAR DOME AND SELF-DAMPING COMPONENT THEREOF.

3,543,348. INJECTION MOLD APPARATUS.

3,671,159. EJECTING GIANT ARTICLES FROM INJECTION MOLD.

3,723,584. METHOD OF MAKING AN ELECTROFORMED MOLD HAVING HEAT TRANSFER CONDUITS AND FOAM POLYURETHANE FOUNDATION.

3,733,161. STRUCTURIZER MOLD.

3,734,985. GLASS FIBER REINFORCED THERMOPLASTIC CELLULAR PLASTICS.

3,744,775. MIXING OF MOLTEN PLASTIC AND GAS.

3,763,293. PROCESS OF MOLDING GIANT ARTICLES OF STRUCTURED PLASTIC.

3,796,779. MIXING OF MOLTEN PLASTIC AND GAS.

General Electric Company is prepared to grant non-exclusive licenses under the following 26 patents on reasonable terms to domestic manufacturers.

Applications for licenses under the following 6 patents may be addressed to: Patent Counsel, Mobile Radio Prod. Dept., General Electric Company, Lynchburg, Va., 24502.

3,878,589. SEPARABLE FASTENING DEVICE.

3,388,320. VOLTAGE REGULATOR COARSE CONTROL DEVICE UTILIZING CURRENT LIMITING REACTOR MEANS.

3,542,986. QUICK-MAKE, QUICK-BREAK ACTUATION FOR HIGH VOLTAGE ELECTRICAL CONTACTS.

3,586,802. LOAD BREAK DEVICE WITH ARC EXTINGUISHING MATERIAL.

3,691,291. SPLICE FOR JOINING HIGH VOLTAGE CABLES.

3,763,461. ELECTRIC CABLE TERMINATION MODULE HAVING A GAS-TRAP VALVE.

Applications for licenses under the following 3 patents may be addressed to: Patent Counsel, Lamp Business Division, General Electric Company, Nela Park, Cleveland, Ohio, 44112.

3,816,054. PHOTOFLASH LAMP HAVING NON-SHORTING CONSTRUCTION.

3,817,683. PHOTOFLASH LAMPS.

3,884,615. FLASH LAMP MOUNT CONSTRUCTION.

Applications for licenses under the following 3 patents may be addressed to: General Electric Company, Construction Materials Div., 4755 Kingsway Drive, Suite 416, Indianapolis, Ind., 46205. Attn.: Div. Patent Counsel.

3,844,150. APPARATUS FOR FORMING COILS USING ROUND CONDUCTOR WIRE.

3,846,824. IMPROVED THERMALLY CONDUCTIVE AND ELECTRICALLY INSULATIVE MOUNTING SYSTEMS FOR HEAT SINKS.

3,873,809. HIGH TEMPERATURE GAS FURNACE.

Applications for licenses under the following 3 patents may be addressed to: Patent Counsel, Chemical and Metallurgical Division, General Electric Company, 500 West Wilson Bridge Road, Columbus, Ohio, 43285.

3,341,920. CUTTING TOOL.

3,341,921. CUTTING INSERT.

3,341,923. CUTTING TOOL.

Applications for licenses under the following 11 patents may be addressed to: Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

3,145,553. CLOTHES WASHING MACHINE.

3,513,866. WASHING MACHINE WITH IMPROVED LIQUID AND ADDITIVE DISPENSING MEANS.

3,699,785. ADDITIVE DISPENSING ARRANGEMENT.

3,831,292. CONDENSER APPARATUS.

3,858,330. CONDENSER APPARATUS.

3,859,004. CONDENSER APPARATUS.

3,868,005. FRICTION CLUTCH WITH CENTRIFUGAL AND MAGNETIC SPEED CONTROL.

3,871,806. INJECTION MOLDING APPARATUS.

3,875,268. CONDENSER APPARATUS.

3,875,462. FOOD WASTE DISPOSER.

3,875,679. CONDENSER APPARATUS.

Eastman Kodak Company announces that non-exclusive licenses are available to responsible applicants under the following 7 patents.

Applications for licenses may be addressed to the Director, Patent Department, Eastman Kodak Company, 343 State St., Rochester, N.Y., 14650.

3,616,735. BLOCKING MECHANISM FOR USE WITH PHOTOGRAPHIC APPARATUS TO AUTOMATICALLY CONTROL FLASH IN RESPONSE TO SCENE BRIGHTNESS.

3,687,037. FILM CARTRIDGE AND CAMERA EMPLOYING SAME.

3,705,696. FILMSTRIP AND FILMSTRIP RETENTION DEVICE.

3,767,132. DEVICE FOR WINDING A FILMSTRIP.

3,816,134. PHOTOGRAPHIC COLOR DEVELOPING SOLUTIONS CONTAINING P-TOLUENESULFONIC ACID SALTS OF P-PHENYLENEDIAMINES.

3,832,179. INHIBITION OF FOG IN PHOTOGRAPHIC COLOR DEVELOPMENT.

3,839,045. PHOTOGRAPHIC COLOR DEVELOPER SOLUTION STABILIZED WITH LITHIUM IONS.

The RCA Corporation offers to grant non-exclusive licenses on reasonable term and conditions under the following 58 patents.

Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y., 10036.

3,881,734. ROTARY STYLUS CLEANER.

3,882,041. EUROPIUM-ACTIVATED ALKALINE-EARTH PYROPHOSPHATE PHOSPHORS.

3,882,207. PROCESS OF PRODUCING DOUBLE-SIDED HOLOGRAPHIC REPLICAS.

3,882,214. TRAPEZOIDAL SMOOTH GROOVES FOR VIDEO DISC.

3,882,267. VIDEO PLAYBACK SYSTEM TRACKING ARM AND PICKUP ASSEMBLY.

3,882,273. OPTICAL BEAM SCANNING SYSTEM.

3,882,327. ABSOLUTE VALVE CIRCUIT EMPLOYING OPPOSITE CONDUCTIVITY TYPE SWITCHES.

3,882,328. CROSS OVER DETECTOR AND RECTIFIER.

3,882,350. DYNAMIC CONVERGENCE CIRCUIT.

3,882,407. AMPLIFIER BLANKING CIRCUIT.

3,882,419. VARACTOR TUNED IMPATT DIODE MICROWAVE OSCILLATOR.

3,882,420. MAGNETICALLY TUNABLE FERRITE STRIPLINE TRAPATT MODE OSCILLATOR AND AMPLIFIER CIRCUITS.

3,882,493. DOPPLER CORRELATION RADAR EXHIBITING REDUCED TIME SIDE LOBES.

3,882,494. DOPPLER CORRELATION RADAR PROVIDING COMBINED TARGET DETECTION AND RANGING.

3,882,495. DOPPLER CORRELATION RADAR PROVIDING COARSE-RANGE DETECTION RESOLUTION.

3,882,728. TEMPERATURE SENSING CIRCUIT.

3,883,313. MODIFIED CZOCHRALSKI-GROWN MAGNESIUM ALUMINATE SPINEL AND METHOD OF MAKING SAME.

3,883,703. METHOD FOR CONDITIONING TRANSMISSION LINES UTILIZING ADJUSTABLE EQUALIZERS AND A RECORDING TECHNIQUE.

3,883,888. EFFICIENCY LIGHT EMITTING DIODE.

3,883,891. REDUNDANT SIGNAL PROCESSING ERROR REDUCTION TECHNIQUE.

3,884,007. HERMETIC SEAL AND METHOD.

3,884,539. METHOD OF MAKING A MULTIALKALI ELECTRON EMISSIVE LAYER.

3,885,061. DUAL GROWTH RATE METHOD OF DEPOSITING EPITAXIAL CRYSTALLINE LAYERS.

3,887,371. PHOTOGRAPHIC METHOD FOR PRINTING VIEWING-SCREEN STRUCTURE INCLUDING TREATMENT OF EXPOSED COATING WITH AMMONIUM COMPOUND.

3,887,878. TRANSISTOR SERIES AMPLIFIER.

3,887,879. CURRENT MIRROR.

3,887,880. BIAS CIRCUITRY FOR STACKED TRANSISTOR POWER AMPLIFIER STAGES.

3,887,916. CORRELATOR AND CONTROL SYSTEM FOR VEHICULAR COLLISION AVOIDANCE.

3,887,924. SCANNING ANTENNA.

3,888,053. METHOD OF SHAPING SEMICONDUCTOR WORKPIECE.

3,888,493. APPARATUS FOR INHIBITING A PLURALITY OF RECORDS FROM BEING DISPOSED ON A TURNTABLE.

3,888,706. METHOD OF MAKING A COMPACT GUARD-BANDED MOS INTEGRATED CIRCUIT DEVICE USING FRAMELIKE DIFFUSION MASKING STRUCTURES.

3,889,151. ENERGIZING TECHNIQUE FOR ELECTROLUMINESCENT DEVICES.

3,889,253. RASTER-SCAN DISPLAY SYSTEM HAVING IMPROVED MEANS FOR READING OUT STORED GAME-SCORE INFORMATION.

3,889,260. ANALOG ECHO PROTECTION CIRCUIT FOR DME.

3,889,551. EQUIPOSIE MECHANISM.

3,890,194. METHOD FOR DEPOSITING ON A SUBSTRATE A PLURALITY OF EPITAXIAL LAYERS IN SUCCESSION.

3,890,630. IMPATT DIODE.

3,890,632. STABILIZED SEMICONDUCTOR DEVICES AND METHOD OF MAKING SAME.

3,890,633. CHARGE-COUPLED CIRCUITS.

3,891,478. DEPOSITION OF EPITAXIAL LAYER FROM THE LIQUID PHASE.

3,891,886. CATHODE RAY TUBE HAVING A LUMINESCENT SCREEN INCLUDING A TWO COMPONENT WHITE-EMITTING PHOSPHORIC MIXTURE.

3,891,891. HIGH VOLTAGE PROTECTION CIRCUIT.

3,891,892. START-UP CONTROL CIRCUIT FOR SCR DEFLECTION.

3,891,895. GROUND FAULT DETECTION.

3,891,935. TRANSISTOR BIASING ARRANGEMENT.

3,885,198. HIGH VOLTAGE REGULATOR.

3,885,201. FAIL-SAFE HIGH VOLTAGE PROTECTION CIRCUIT.

3,885,860. FABRICATION OF LIQUID CRYSTAL DEVICES.

3,886,307. ON-OFF SYSTEM FOR TELEVISION RECEIVERS.

3,886,394. IMAGE DISPLAY EMPLOYING FILTER COATED PHOSPHOR PARTICLES.

3,886,410. SHORT CIRCUIT PROTECTION APPARATUS FOR A REGULATED POWER SUPPLY.

3,886,435. VBE VOLTAGE SOURCE TEMPERATURE COMPENSATION NETWORK.

3,886,454. CONTROL APPARATUS FOR A TWO-WAY CABLE TELEVISION SYSTEM.

3,886,460. PULSE POSITION DISCRIMINATOR.

3,886,464. SELF-BIASED COMPLEMENTARY TRANSISTOR AMPLIFIER.

3,886,466. BIAS CIRCUITRY FOR STACKED TRANSISTOR POWER AMPLIFIER STAGES.

3,886,505. SEMICONDUCTOR PACKAGE HAVING MEANS TO TUNE OUT OUTPUT CAPACITANCE.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 5, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-7-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-7-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-19-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-7-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-4-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination: Horology; Acoustics; Recorders; Weighing Scales.	12-4-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	7-2-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-8-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-11-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-2-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-13-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	11-14-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	11-21-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-2-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	10-11-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-2-75

Expiration of patents: The patents within the range of numbers indicated below expire during August 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,845,625 to 2,849,713 inclusive
Plant Patents..... Numbers 1,740 to 1,745 inclusive

REISSUE PATENTS

GRANTED AUGUST 12, 1975

ERRATA

See CLASS	See PATENT NO.
228–180	28,509

REISSUES

AUGUST 12, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

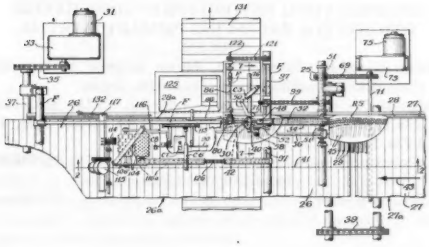
Re. 28,508
LOIN PULL AND RIB CUT MACHINE

Richard R. Neebel, Waterloo; Clarence L. Harms, Cedar Falls; James D. Neebel, Denver, and Richard E. Doerfer, Waterloo, all of Iowa, assignors to Container Corporation of America, Cedar Falls, Iowa

Original No. 3,546,737, dated Dec. 15, 1970, Ser. No. 719,320, Apr. 8, 1968. Application for reissue Nov. 19, 1971, Ser. No. 200,425

Int. Cl. A22c *17/04*

U.S. Cl. 17—1 G **58 Claims**



1. In a loin pull and rib cut machine, conveyor means operable to convey pork sides through said machine, said machine having a loin pull station, a loin push-off station and a rib cut station, loin pull mechanism at said loin pull station comprising a scribe saw and a U-shaped loin pull knife, said scribe saw being positioned with respect to said conveyor means to scribe the ribs of the pork side adjacent one edge of the loin, said loin pull knife having a portion immediately following said scribe saw and a portion to cut under the loin, means for causing said scribe saw and said portion immediately following it to follow the shape of the loin comprising a shoe carried by said scribe saw and adapted to follow the contour of the back bone of the pork side, means to bias said shoe toward the back bone, means at said push-off station to push the cut loin from the pork side, and means at said rib cut station to cut the ribs from the pork side.

Re. 28,509
COMPENSATING BASE FOR LEAD-FRAME BONDING

Benjamin Piechocki, deceased, late of Bethlehem, Pa., by Stephen H. Fletcher, Short Hills, N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Original No. 3,729,810, dated May 1, 1973, Ser. No. 207,854, Dec. 14, 1971. Application for reissue Jan. 28, 1974, Ser. No. 437,079

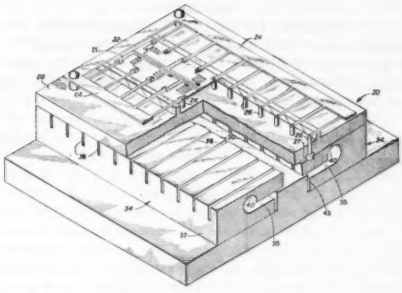
Int. Cl. B23k *5/22*

U.S. Cl. 228—180 **4 Claims**

1. A method of bonding a plurality of leads to a brittle planar article which comprises the steps of:

supporting the article with a plurality of cantilever spring elements *extending from a base with a space between the elements and the base*, each element being located below a point where a lead is desired and each element being movable independently of the others; and

compressively engaging all of the desired leads simultaneously against said brittle supported article to bond said leads to said article, whereby the spring elements are deflected independently of one another *into the space between the elements and the base* to reduce stresses introduced to said article during said compressive engagement thus preventing cracking of the article.



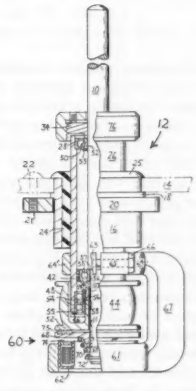
Re. 28,510
SPINDLE ASSEMBLY

Gordon C. Anderson, Clemson, and John D. Page, Greenville, both of S.C., assignors to Maremont Corporation, Chicago, Ill.

Original No. 3,640,062, dated Feb. 8, 1972, Ser. No. 77,058, Oct. 1, 1970. Application for reissue Feb. 8, 1973, Ser. No. 330,564

Int. Cl. D01h *7/12, 7/22*

U.S. Cl. 57—88 **14 Claims**



1. An improved spindle assembly for textile spinning and twisting machines comprising:

a spindle blade;

a single bearing support sleeve concentric with said spindle blade;

a driving whirl concentric with both said spindle blade and said support sleeve;

a plurality of spindle bearing sets aligned and supported by and intermediate said spindle blade and said support sleeve; *and*

a whirl bearing set aligned and supported by, and intermediate said whirl and said support sleeve [; and

an electromagnetically operable drive and brake clutch subassembly substantially concentric with said spindle blade and supported by said spindle blade and said support sleeve.]

Re. 28,511

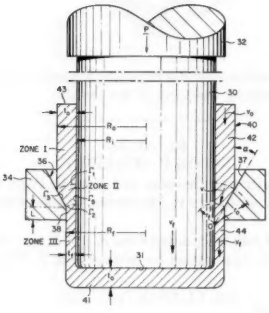
SHAPING OF HOLLOW WORKPIECES

Betzalel Avitzur, 817 31st St., Allentown, Pa. 18104

Original No. 3,685,337, dated Aug. 22, 1972, Ser. No. 889,218, Dec. 30, 1969. Application for reissue Aug. 8, 1974, Ser. No. 495,853

Int. Cl.[2] B21D *22/20*

U.S. Cl. 72—347 **18 Claims**



1. In a method of shaping a hollow workpiece with the aid of a punch and a die having an aperture extending therethrough, said aperture including a conical portion having a semi-cone angle α; the steps of providing said workpiece with a side wall having an inner and an outer surface; causing said punch to engage said inner surface of the side wall of the hollow workpiece so that the latter is positioned on said punch; moving said punch with said workpiece thereon relative to said die and into said conical portion of the aperture thereof to iron said side wall and thereby reduce the thickness and increase the length thereof to a predetermined degree while subjecting said workpiece to differential frictional forces including a predetermined, relatively large frictional force resulting from contact of said inner surface of the side wall with said punch, and a smaller frictional force acting on said outer surface of the side wall and resulting from movement of said side wall relative to said die, said differential frictional forces being effective to limit tensile stresses in the ironed portion of said side wall during ironing; and controlling said differential frictional forces in part by said semi-cone angle α being [in agreement with the equation

$$\left[\sin\alpha\sqrt{1-\frac{3}{4}\sin^2\alpha}-\cos\alpha\cdot E\left(\alpha,\frac{\sqrt{3}}{2}\right)-\frac{m_1}{2}+\frac{m_2}{2}\cos\alpha\right]\ln\frac{t_o}{t_f}+1-\cos\alpha=0,$$

limited by the value determined by the equation

$$E(\alpha,\sqrt{3/2})+\frac{m_1}{2}\cos\alpha-\frac{m_2}{2}=0,$$

wherein

$$E\left(\alpha,\frac{\sqrt{3}}{2}\right)=\text{elliptic integral of second order,}$$

m_1 = constant friction factor at conical portion of the die aperture,

m_2 = constant friction factor at punch [,

t_o = original wall thickness of side wall of workpiece,

t_f = final wall thickness of side wall of workpiece after ironing].

Re. 28,512

RECIPROCATING PISTON TYPE ENGINES HAVING WEIGHTS FOR BALANCING PRIMARY INERTIAL FORCES

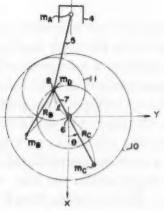
Haruo Kinoshita, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Haisha, Hamakita, Japan

Original No. 3,744,342, dated July 10, 1973, Ser. No. 184,113, Sept. 27, 1971. Application for reissue Aug. 1, 1974, Ser. No. 493,849

Claims priority, application Japan, Oct. 2, 1970, 45-98096

Int. Cl.[2] F16F *15/26*

U.S. Cl. 74—604 **7 Claims**



1. A reciprocating piston type internal combustion engine having a crankcase, a crank-shaft rotatably mounted in said crankcase and including crank journals, crank arms and a crank-pin, a piston and a connecting rod having the opposite ends thereof rotatably connected to said crank-pin and said piston respectively, said engine comprising

a. a pivot provided on one of the crank arms in the same phase as and rigidly fixed to the crank-pin and protruding toward the connecting rod,

b. a small gear rotatably mounted on said pivot between said one of the crank arms and the connecting rod, and being in side-by-side relation with the large diameter end of the connecting rod,

c. an internal gear having a number of teeth twice that of said small gear and fixed to the crankcase in meshing engagement with said small gear,

d. a rotating balance weight provided on said small gear adjacent to one side of the connecting rod in such a way that it will be in its lower position when the crank-pin is in the top dead center, and

e. revolving balance weight provided on said crank arms on the side opposite to the crank-pin with respect to the crank journals.

Re. 28,513
APPARATUS FOR AUTOMATICALLY TESTING PULMONARY FUNCTIONS

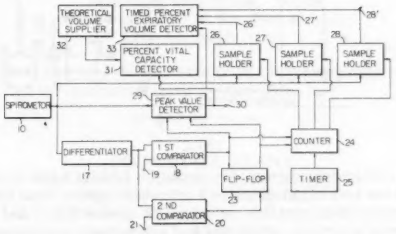
Takaji Suzuki, Tokyo; Sunao Wada, and Yukio Nishimoto, both of Hiroshima, all of Japan, assignors to Hitachi Limited, Tokyo, Japan

Original No. 3,621,835, dated Nov. 23, 1971, Ser. No. 839,487, July 7, 1969. Application for reissue Nov. 19, 1973, Ser. No. 416,833

Claims priority, application Japan, July 8, 1968, 43-47107

Int. Cl. A61b *5/08*

U.S. Cl. 128—2.08 **27 Claims**



19. An apparatus for testing the pulmonary function of a subject in combination with a spirometer which is adapted to produce an electric signal having an amplitude corresponding to the subject's expiratory volume of air exhaled thereinto by the subject, which apparatus comprises:

first means adapted to receive the electric signal from said spirometer for operatingly producing start and end signals representative respectively of commencement and termination of the subject's expiration of air when the amplitude of the electric signal exceeds a first predetermined level and falls below a second predetermined level, respectively; and

second means adapted to receive the electric signal from said spirometer and rendered operative from the start signal to the end signal for operatively detecting a peak value of the electric signal during the operative period thereof;

whereby the peak value of the electric signal thus obtained is recognized as a correspondence to a value of vital capacity of the subject.

Re. 28,514
DEVICE FOR WINDING TEXTILE THREADS

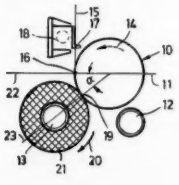
Heinrich Enneking, Karlsruhe-Waldstadt, and Gunter Jahrig, Neureut, both of Germany, assignors to Industrie Werke Karlsruhe-Augsburg Aktiengesellschaft, Karlsruhe, Germany

Original No. 3,628,741, dated Apr. 1, 1974, Ser. No. 852,366, Aug. 22, 1969. Application for reissue Feb. 26, 1973, Ser. No. 335,920

Claims priority, application Germany, Sept. 11, 1968, 1785322

Int. Cl. B65h *54/20, 54/42*

U.S. Cl. 242—18 DD **6 Claims**



1. A device for winding a textile thread, particularly a thread made of synthetic material, comprising a rotatable roll, at least two bobbin supports adapted to be pressed in frictional engagement with the circumference of said roll and also adapted to be moved away from said roll, and a horizontally reciprocable thread guide arranged at a predetermined distance above an axially extending surface line of said roll which line is arranged in a horizontal plane passing through the axis of rotation of said roll, said thread contacting said roll at said surface line and extending from said surface line in contact with the roll along the short circumferential distance in the direction of rotation of said roll until the thread reaches a point where a first one of said bobbin supports engages said roll so that said thread is wound upon said bobbin support to form a bobbin thereon, the normal line extending through said last-named point and the axis of rotation of said roll enclosing with the normal line extending through said surface line and said axis of rotation an angle which is different from zero, a second one of said bobbin supports being disposed laterally spaced from said first-mentioned bobbin support and below said horizontal plane passing through the axis of rotation of said roll, whereby said thread may be transferred to said second one of said bobbin supports when the bobbin formed on the first-mentioned support is completed and whereby bobbins fomed on said bobbin supports are adapted to engage said roll along lines disposed below said horizontal line passing through the axis of rotation of said roll.

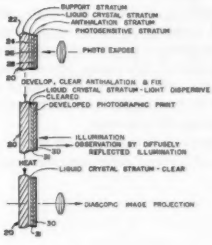
Re. 28,515
PHOTOGRAPHIC PRODUCTS FOR DIRECT OBSERVATION AND OPTICAL PROJECTION, AND PHOTOGRAPHIC PROCESSES FOR THEIR PRODUCTION AND UTILIZATION

Gerald Altman, 41 Westminster Rd., Newton Centre, Mass. 02154

Original No. 3,802,884, dated Apr. 9, 1974, Ser. No. 225,187, Feb. 10, 1972. Continuation of Ser. No. 734,039, June 3, 1968, abandoned, which is a continuation-in-part of Ser. No. 655,714, July 6, 1967, abandoned. Application for reissue July 15, 1974, Ser. No. 488,544

Int. Cl. G03c *1/78;* **G02f** *1/36*

U.S. Cl. 96—67 **15 Claims**



1. A visual sheet product comprising a visual image stratum and a light control stratum, said visual image stratum being composed of a photographic medium selected from the class consisting of photosensitive materials and materials produced by exposing and developing photosensitive materials, said light control stratum being composed of a microcrystalline medium having a crystalline state and an amorphic state as a function of the energy level of said light control stratum, said crystalline state being characterized by uniform diffuse reflection throughout said light control stratum, said amor-

phic state being characterized by uniform optical clarity throughout said light control stratum, whereby, when said microcrystalline medium is in said crystalline state, said visual image stratum is presented in an opaque format for observation in terms of diffuse light and, when said microcrystalline medium is in said amorphic state, said visual image is presented in a transparent format for projection in terms of condensed light.

Re. 28,516

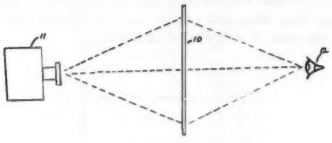
POLYMERIC REAR PROJECTION SCREENS

Chen-I Lu; Edward D. Morrison, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Original No. 3,573,141, dated Mar. 30, 1971, Ser. No. 838,304, July 1, 1969. Application for reissue Mar. 29, 1973, Ser. No. 345,921

Int. Cl. C03b *21/60*; **C08f** *45/14*

U.S. Cl. 428—213 **19 Claims**



1. In a polymeric sheet especially adapted for use as a rear projection screen; said sheet

(a) consisting essentially of polypropylene having a melt flow rate of at most about 90,

(b) having a thickness **[** of from about 20 to about 80 mils **]** *such that it transmits light;* and

(c) having two surface layers containing relatively smaller crystalline spherulites and a core layer containing relatively larger crystalline spherulites; the diameter of the larger crystals in said core layer being between about 15 and about 45 microns and said core layer being at least three-fourths as thick as said sheet, and said sheet containing at least about 60 weight percent of crystalline spherulites having average diameters of from about 5 to about 20 microns;

the improvement which comprises incorporating evenly through said sheet at least about 2 weight percent of finely divided, particulate "crystal deforming material," said crystal deforming material (i) being non-nucleating, (ii) having a refractive index within about 0.05 unit of that of said polypropylene, and (iii) having particle diameters in the range of from about 5 to about 50 microns.

16. An improved rear projection screen material as in claim 1, wherein said "crystal deforming material" is calcium carbonate.

Re. 28,517

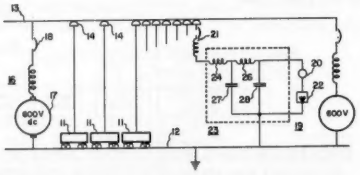
FILTER-TO-LINE TRANSIENT ISOLATOR

Earnest F. Weiser, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Original No. 3,731,150, dated May 1, 1973, Ser. No. 215,572, Jan. 5, 1972. Application for reissue July 1, 1974, Ser. No. 484,588

Int. Cl. H02h *7/10*

U.S. Cl. 317—20 **8 Claims**



1. An improved protective circuit for limiting a line in-rush and out-rush of current from a propulsion system input filter, wherein the current flow between a DC power source and the filter is selectively attenuated and alternatively unattenuated to enable drawing power without a loss, wherein the improvement comprises:

a. a static power conversion unit for converting direct current from the DC power source **[** into alternating current; **]**

b. a filter connected between said power conversion unit and said DC power source for filtering the ripple voltage from said power conversion unit and ripple current from said DC power source, said filter comprising at least one capacitor in parallel with said power conversion unit and at least one reactor in series with said power conversion unit and power source, said reactor having both a saturable core portion and a non-saturable core portion; and

c. means for occasionally and alternately charging and discharging said capacitor through said reactor; wherein said reactor is so constructed that during periods of charging of said capacitor the flux in said saturable core portion moves toward a condition of positive saturation and during periods of discharging of said capacitor **[** and **]** *the* flux therein moves toward a condition of negative saturation, thereby providing during these periods an inductive reactance to substantially attenuate the current flow through said saturable core portion, whereas during periods of steady state current in-flow, subsequent to the charging of said capacitor, said saturable core portion remains saturated to allow for the substantially unimpeded flow of current therethrough, and said non-saturable core portion offers a relatively small fixed reactance, which combines with that of said capacitor to perform the filtering function.

PLANT PATENTS

GRANTED AUGUST 12, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,760
CHRYSANTHEMUM PLANT
Grace Y. Nakano, 1166 Bryant Ave., Mountain View, Calif. 94040
Filed Jan. 21, 1974, Ser. No. 435,321
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct variety of Chrysanthemum plant having the characteristics of a bronze flower.

3,761
POINSETTIA PLANT
Ned Keefer, Andrews, Ind., assignor to Paul Ecke, Jr., Encinitas, Calif.
Filed June 20, 1974, Ser. No. 481,453
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct variety of poinsettia plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a general similarity in most respects to the variety "Dark Red Annette Hegg" (Plant Pat. No. 3,160), including a short growing and compact plant habit, a uniform and fast rooting habit, a self-branching habit which produces multiple blooms without pinching off the terminal buds, attractive green foliage, distinctive, attractive and stable dark pink bracts instead of dark red bracts like "Dark Red Annette Hegg," and long-lasting plant qualities.

3,762
WHITE ASH TREE
Willet N. Wandell, Rte. 3, Myra Station Road, Urbana, Ill. 61801
Filed June 27, 1974, Ser. No. 483,887
Int. Cl. A01h *5/12*

U.S. Cl. Plt.—51 **1 Claim**

1. The variety of white ash substantially as shown and described herein, characterized particularly by an extremely robust growing habit, larger leaflets and a stronger petiole, together with a heavy dense compact habit of growth without pruning and trimming.

3,763
POINSETTIA PLANT
Rolf Grotum, Bendingbostel, Germany, assignor to Paul Ecke, Jr., Encinitas, Calif.
Filed Aug. 19, 1974, Ser. No. 498,725
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct variety of poinsettia plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a short-growing and compact plant habit, a uniform and fast rooting habit, a self-branching habit resulting in the production of multiple blooms without pinching off the terminal buds as required for other poinsettia varieties, attractive green foliage which is darker green in color than the foliage of "Annette Hegg," attractive brighter brick red bracts than the normal red bracts of "Annette Hegg," said bracts having less tendency to droop than the bracts of "Annette Hegg" when the plants reach maturity, and the bright brick red color of the bracts being more stable and retaining their brilliance much longer when the plants are used for home decoration, long-lasting plant qualities, and a distinctly earlier blooming habit than other standard Hegg varieties.

3,764
POINSETTIA PLANT
Thormod Hegg, Lierbyen, Norway, assignor to Paul Ecke, Jr., Encinitas, Calif.
Filed Aug. 19, 1974, Ser. No. 498,726
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct variety of poinsettia plant, substantially as herein shown and described, characterized particularly as to novelty by its general similarity to the variety "Dark Red Annette Hegg" (Plant Pat. No. 3,160), but being principally distinguished therefrom by its earlier blooming habit, much darker green foliage color, dark red bracts which are more stable and retain their brilliance much longer and with less tendency to fade when grown under the same conditions as "Dark Red Annette Hegg," and less tendency of the bracts to droop when the plants reach maturity.

PATENTS

GRANTED AUGUST 12, 1975

ERRATA

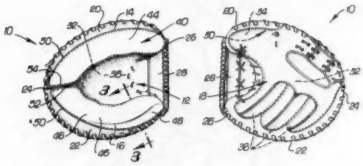
For CLASS	See PATENT NO.
228–122	3,898,729
060–525	3,898,841
060–653	3,898,842
061–013	3,898,843
061–035	3,898,844
061–045 D	3,898,845
061–046	3,898,846
061–046.5	3,898,847
061–053.52	3,898,848
061–053.52	3,898,849
061–053.52	3,898,850
061–053.52	3,898,851
061–072.4	3,898,852
062–055	3,898,853
062–062	3,898,854
062–075	3,898,855
062–098	3,898,856
062–117	3,898,857
062–135	3,898,858
062–135	3,898,859
062–155	3,898,860
062–177	3,898,861
062–197	3,898,862
062–208	3,898,863
062–272	3,898,864
062–280	3,898,865
062–306	3,898,866
062–507	3,898,867
063–002	3,898,868
063–015	3,898,869
063–018	3,898,870
074–010.15	3,898,871
195–028	3,898,959
122–250 R	3,899,031
128–058	3,899,115
250–301	3,899,213
195–062	3,899,376
196–129	3,899,420
250–199	3,899,428
250–199	3,899,429
250–199	3,899,430
235–150.2	3,899,671
350–293	3,899,672
250–532	3,899,682
250–532	3,899,683
250–535	3,899,684
250–536	3,899,685

PATENTS

GRANTED AUGUST 12, 1975

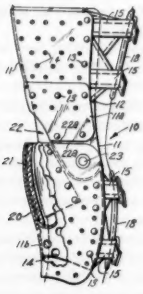
GENERAL AND MECHANICAL

3,898,696
BASEBALL GLOVE
Alexander Campanis, 3113 Coronado Dr., Fullerton, Calif. 92635
Filed Oct. 15, 1974, Ser. No. 514,373
Int. Cl.[2] A41D *13/08*
U.S. Cl. 2—19 **8 Claims**



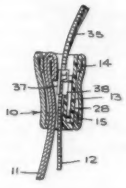
1. A baseball glove provided with a front, catching side having thumb and finger edges and an opposed, rear side spaced from said catching side, said rear and catching sides being interconnected along opposite edges thereof by thumb and finger edge surfaces and being provided therebetween with a hand-receiving cavity having a palm portion, a thumb portion extending along said thumb edge surface and a finger portion extending along said finger edge surface, said catching side having a heel portion and a tip portion and having a pocket extending from adjacent said heel portion of said catching side toward said tip portion thereof and overlying at least said palm portion of said hand-receiving cavity, said pocket being of a relatively dull, substantially nonreflective color, said catching side having a marginal portion of a bright, contrasting, reflective color at least partially surrounding said pocket and extending along said thumb and finger edges of said catching side at least substantially from said heel portion to said tip portion thereof, said marginal portion occupying at least a major part of that portion of said catching side which lies adjacent said pocket.

3,898,697
KNEE PROTECTIVE GEAR
Charles C. Whitehead, 113 Glenmore Ave., Baltimore, Md. 21228
Filed Nov. 13, 1973, Ser. No. 415,311
Int. Cl. A61f *5/00*
U.S. Cl. 2—22 **1 Claim**



1. A knee protective gear, comprising in combination an upper member of generally semicylindrical shape so to rest against an above knee portion of a person's leg, said upper member being comprised of an outer, curved steel portion and an inner curved plastic portion that are riveted together, perforated openings through said portions in order to reduce perspiration by a wearer, a lower edge of said upper member being upwardly arched at its center so to form downwardly depending opposite side ends in said steel portion, a flanged axle through each said depending side end, said axle being axially aligned with each other, and a lower portion pivotally attached on said axles, said lower portion being of generally semicylindrical shape so to rest against and below a knee portion of a person's leg, and being comprised of a knee sling perforated with openings therethrough so to reduce perspiration, a padding on an inner side of said sling for positioning against a person's knee, and each said upper and lower member having a plurality of straps secured to each side edge thereof for securement together by buckle means, said straps extending around an outer side of plastic plates positioned against a rear side of said wearer's leg, said plates being secured by rivets to certain of said straps.

3,898,698
NECKTIE
David J. Byrd, Orange, and Deane F. Harris, Gordonsville, both of Va., assignors to Byrd Associates, Orange, Va.
Filed Jan. 24, 1974, Ser. No. 436,377
Int. Cl.[2] A41D *25/02*
U.S. Cl. 2—150 **18 Claims**

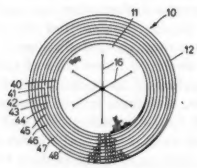


1. A necktie comprising a knot portion having an opening therethrough, rigid body imparting means disposed in said opening and secured to said knot portion, a first depending tie portion secured to said knot portion, a second depending tie portion having a neck embracing loop extending through the opening in said knot portion, the lower inner edges of the neck embracing loop of said second depending tie portion having interlockable means, and means secured to said rigid means, within said opening and operatively connected to said interlockable means for interlocking and unlocking said interlockable means upon relative movement between said interlockable means and said interlocking and unlocking means for varying the size of said loop.

3,898,699
CAP HAVING KNITTED CROWN AND CROCHETED BRIM AND METHOD FOR MAKING THE SAME
Donald Zientara, Greendale, and Richard A. Smith, Brookfield, both of Wis., assignors to Zwicker Knitting Mills, Appleton, Wis.
Filed Mar. 5, 1974, Ser. No. 448,252
Int. Cl.[2] A42C *1/00*
U.S. Cl. 2—192 **11 Claims**

1. A cap comprising: a crown formed of a knitted tubular sleeve having a lower edge and a relatively stiff crocheted

brim connected to and extending entirely around and outwardly from said edge, said crocheted brim comprising a continuous band of crocheted stitching connected to and



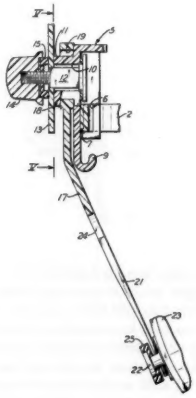
around said lower edge of said crown spirally wound to extend outwardly therefrom in successive rows, each row being secured by stitching to an adjacent row.

3,898,700

EAR PROTECTING DEVICE FOR SAFETY CAPS

Ellison L. Davison, Gibsonia, and Leo D. Ziegler, Monroeville, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed June 26, 1974, Ser. No. 483,409
Int. Cl. A42b *1/06*
U.S. Cl. 2—209 **9 Claims**



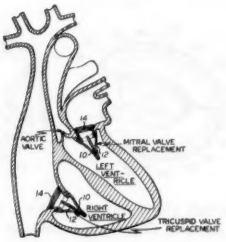
1. An ear protecting device for mounting on a safety cap having a brim, said device comprising a band adapted to surround the crown of such a cap, a pair of brackets mounted on the band at opposite sides thereof and provided with downwardly extending hooks for hooking under the edge of the brim, each of said brackets having an opening therethrough above said band, the axis of the opening extending substantially radially of the band, a cylindrical flange projecting outwardly from the bracket around said opening, a pair of spring arms for supporting ear covers, each arm having a hole through one end receiving one of said flanges, an ear cover carried by the other end of the arm, and a retaining lug projecting radially from the outer end portion of each cylindrical flange and overlapping the arm supported by the flange to hold it thereon, the wall of said arm hole being provided with a radial notch to enable the arm to be slipped off said flange after the arm has been rotated on the flange to align the notch with said lug.

3,898,701

IMPLANTABLE HEART VALVE

Joseph La Russa, 451 Rutledge Dr., Yorktown Heights, N.Y. 10598

Filed Jan. 17, 1974, Ser. No. 434,321
Int. Cl. A61f *1/22*
U.S. Cl. 3—1.5 **5 Claims**



1. Heart valve comprising:

a. a flattened, flexible tubular body;

b. spacing means inserted into and opening the upstream end of said tubular body, the downstream end of said tubular body forming a flap valve with inner working surfaces that contact each other when the valve is closed and move apart when the valve is open;

c. a centrally positioned, flat, tongue-like anti-inversion member carried by said spacing means and extending into the tubular body between the working surfaces thereof, a portion of said working surfaces contacting said anti-inversion member when the valve is closed and the remaining portion of said working surfaces contacting each other around said anti-inversion member when the valve is closed; and

d. an annular mesh sleeve embedded in the upstream end of said tubular body for suturing the valve to the heart tissue.

3,898,702

ADJUSTABLE BED

Robert Goodman, Gladwyne, Pa., assignor to RCA Corporation, New York, N.Y.

Filed June 3, 1974, Ser. No. 476,056
Int. Cl.[2] A61G *7/10*
U.S. Cl. 5—68 **8 Claims**

1. An adjustable bed comprising, in combination:

an elongated base first frame;

a second frame generally parallel to and movable relative to said base frame along the length dimension thereof;

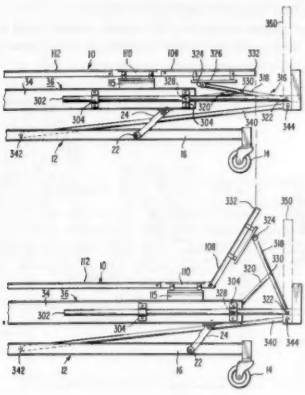
a third frame pivotally coupled to said second frame, the pivotal axis being perpendicular to the length dimension of said first frame;

a fourth frame movable relative to said second frame in a direction parallel to the length dimension of said first frame, coupled to said first frame in such a manner as to prevent substantial movement along the length dimension of said first frame;

motion translating means coupling said third frame and fourth frame for causing said third frame to pivot about its pivotal axis as said second frame moves longitudinally

relative to said fourth frame; and

means for creating longitudinal motion of said second frame



relative to said first frame and said fourth frame for causing said third frame to pivot about its axis.

3,898,703

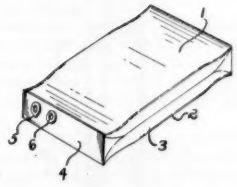
METHOD AND MEANS FOR INCREASING THE AIR PRESSURE WITHIN SELF-INFLATED HOLLOW BODIES FOR USE AS CUSHIONS AND FOR LIKE PURPOSES

Paul Stamberger, 552 W. University Parkway, Baltimore, Md. 21210

Division of Ser. No. 228,223, Feb. 22, 1972, Pat. No. 3,829,918, which is a continuation-in-part of Ser. No. 76,734, Sept. 30, 1970, Pat. No. 3,643,268, which is a continuation-in-part of Ser. No. 738,657, June 20, 1968, Pat. No. 3,553,113, which is a continuation-in-part of Ser. No. 453,252, May 5, 1968, abandoned. This application Jan. 3, 1974, Ser. No. 430,555

Int. Cl.[2] A47C *27/08*

U.S. Cl. 5—348 R **6 Claims**



1. A method for increasing the air pressure within an air-inflated, box-like, air-impervious body comprising a top portion and a bottom portion of substantially the same size and configuration connected along their marginal edges in airtight relation by a flexible air-impervious interconnecting member forming the sides and end portions of said body and of a height sufficient to form an air-inflated body of the desired height, and wherein said interconnecting member has a stiff portion extending along a portion of the length thereof which is movable to and from a substantially vertical position to and from a substantially horizontal position overlying the adjacent portion of said top portion, and wherein said body is provided with a manually-operable air inlet and air outlet valve which is closed following the inflation of said body and which is opened to permit the escape of air from said body when said body is collapsed and deflated, the steps of moving said stiff portion from its substantially vertical position to a substantially horizontal position when said valve is closed to force the air within said body adjacent said stiff portion into the remaining portion of said body to increase the air pressure within said remaining portion, and retaining said stiff portion in its substantially horizontal position when said body is in use as an air-inflated cushion, pillow, mattress or the like.

3,898,704

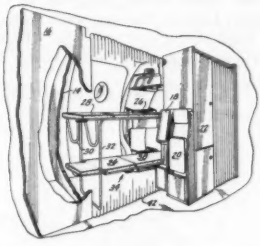
CONVERTIBLE SEAT-BED EQUIPMENT

William C. Gallaher, San Clemente; Jerome P. Stephens, Orange; Phillip J. Testa, Norwalk, and James E. Wein, Orange, all of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed July 18, 1974, Ser. No. 489,468

Int. Cl.[2] A47C *13/38*

U.S. Cl. 5—2 R **6 Claims**



1. A convertible seat-bed equipment for converting a reclining seat into a bed comprising:

a seat back frame pivotally mounted at a pivot point near the top thereof to a wall;

a seat bottom frame pivotally connected at the rear end thereof to said seat back frame;

arcuate rails on said wall;

rollers on said seat back frame engageable with said rails as said seat bottom frame is moved fore and aft to desired seat back frame inclination;

said arcuate rails having a roller engaging surface, points thereon of which are of equal distance from said seat back frame pivot point.

3,898,705

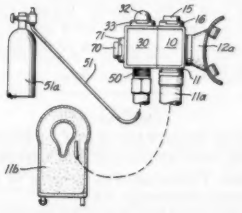
CONVERTIBLE INFLATION CONTROL FOR UNDERWATER DIVING VESTS

Manfred Schuler, Costa Mesa, Calif., assignor to Pittman Products, Inc., Huntington Park, Calif.

Filed Sept. 13, 1974, Ser. No. 505,789

Int. Cl.[2] B63C *9/24*

U.S. Cl. 9—313 **12 Claims**



1. An inflation control for underwater diving vests comprising a first oral inflation housing having a mouthpiece outlet and a vest outlet, a valve controlling the flow of air between said outlets, a push button control mounted on said first housing for opening said valve, said first housing being usable by

itself for oral inflation of said vest and for emergency breathing of air from said vest, a plate removably mounted on said first housing, said plate closing off passage means in said first housing extending from a portion of said vest outlet beyond said valve, a second housing adapted to be connected to said first housing upon the removal of said plate, said second housing converting said control for inflation of said vest from a source of air pressure, said second housing having passage means connecting with the passage means in said first housing for the flow of air under pressure through both of said housings from the source of air under pressure to said vest outlet beyond said valve.

3,898,706

METHOD OF FORMING A RECESS IN A FASTENING ELEMENT HEAD

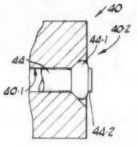
Louis France Rivalland, and Aubrey Richard McGarry, both of Westville, South Africa, assignors to Utility Products (Proprietary) Limited, Durban, South Africa

Filed Nov. 6, 1973, Ser. No. 413,295

Claims priority, application South Africa, Nov. 21, 1972, 72/8229

Int. Cl. B23g *9/00*; **B21k** *1/46*

U.S. Cl. 10—10 R **6 Claims**



1. A method of forming a centrally located axially outwardly directed cruciform recess suitable for use with a chisel-ended screw driver and comprising a pair of intersecting slots which are substantially flat-bottomed and have their ends closed off in the axially outwardly directed end face of the head of a fastening element including a shank and a head at one end of the shank, the head being substantially circular in end elevation and the slots having substantially flat floors located in a common plane normal to the polar axis of the element, which method comprises the steps of:

preforming the head in blank by cold-working with a rough punch having a concave die formation such as to render the head in blank at least in part substantially rectangular in end elevation; and

cold-forging the recess by means of a finisher punch provided with a cruciform die formation comprising a pair of intersecting slot-forming formations having flat coplanar outwardly directed faces, the die formation being located centrally relative to the head during the cold-forging step, with the flat faces of the slot forming formations normal to the polar axis of the element, the slot forming formations being aligned with the head so that they extend substantially along the diagonals of the head during the cold-forging step.

3,898,707

LOW BALANCED REACTANCE DELTA CLOSURE FOR ELECTRIC ARC FURNACE TRANSFORMERS

James J. Trageser, Pittsburgh, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 432,918, Jan. 14, 1974, abandoned. This application July 23, 1974, Ser. No. 491,080

Int. Cl. H05b *7/10*

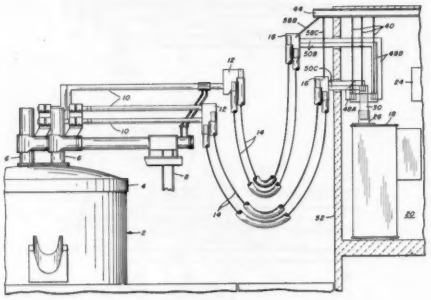
U.S. Cl. 13—12 **9 Claims**

1. In a three phase electric arc furnace, a low balanced reactance delta closure connecting a power transformer to flexible cables comprising

a row of secondary coil terminal blades projecting from a face of the transformer;

a plurality of terminal risers, one of each of said risers being connected to each terminal blade;

a tubular phase collector for each phase, said collectors being arranged generally parallel to said row of blades and delta connected to said risers;



a tubular phase conductor for each phase, said conductors being arranged generally parallel to each other and in a triangular spatial relation, each of said phase conductors having means connecting one end thereof to one of said phase collectors and;

a flexible cable terminal head for each phase mounted on the other end of each of said phase conductors, said other ends being terminated to provide a generally triangular spacial relation for the flexible cables connected to said terminal heads.

3,898,708

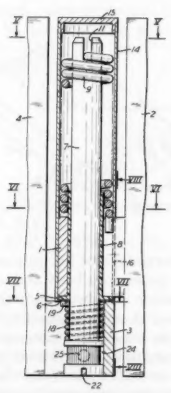
DOOR HINGE ADJUSTABLE CLOSING SPRING

Joseph W. Gwozdz, Clark Summit, Pa., assignor to McKinney Manufacturing Company, Scranton, Pa.

Filed Dec. 30, 1974, Ser. No. 537,086

Int. Cl.[2] **E05F** *1/08*

U.S. Cl. 16—72 **13 Claims**



1. A door hinge comprising a jamb leaf having a knuckle, a door leaf having a knuckle above the jamb leaf knuckle and supported by it, a hinge pin extending through said knuckles and having an exposed end portion projecting from one of them, the pin being stationary in one of said knuckles during opening and closing of the hinge, there being relative rotation between the other knuckle and the pin during said opening and closing, a closing coil spring encircling said projecting end portion of the pin and having one end anchored to the pin and

having its opposite end anchored in fixed position relative to said other knuckle, the spring being coiled in the direction that will cause it to be wound more tightly during opening of the hinge, and an adjustment coil spring tightly encircling the pin in the knuckle in which the pin is stationary, one end of the adjustment spring being free and the other end being anchored to the surrounding knuckle, and the adjustment spring being coiled in the direction that will permit the pin to be turned manually in it to wind the closing spring more tightly.

3,898,709

HINGE FOR KNEE BRACE

Hector E. Lewis, deceased, late of Cincinnati, Ohio, by June Rae MacLean, executrix, Milford, Ohio, assignors to Surgical Appliance Industries, Inc., Cincinnati, Ohio

Filed Sept. 26, 1974, Ser. No. 509,449

Int. Cl.[2] E05D *11/10*

U.S. Cl. 16—145 **8 Claims**

1. A lockable hinge for a knee brace, said hinge comprising:

a first and a second elongated hinge arm;

a pivot connection between said first and second hinge arms, said pivot connection being disposed near one end of each arm, whereby said arms can be rotated to a plurality of angular positions relative to one another;

each of said arms having a locking aperture formed therein spaced from said pivot connection, a locking pin, and a locking pin support member;

means supporting said locking pin support member upon said first arm, said pin being in alignment with said locking aperture in said first arm;

spring means urging said pin through the aperture in said first arm and toward said second arm, said pin being effective to enter the aperture in said second arm to lock said hinge arms in a predetermined angular position when the aperture in said second arm is brought into alignment with said pin; and

means responsive to lateral pressure for causing said pin to be shifted outwardly and withdrawn from the aperture in said second hinge member to free said hinge members for relative rotation.

3,898,710

PROCESS AND APPARATUS FOR PRODUCING READILY PROCESSIBLE STAPLE FIBER AND TOW

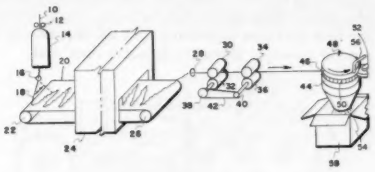
Charles Wayne Cook, Salisbury, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Filed Aug. 1, 1972, Ser. No. 277,026

Int. Cl. D01g *1/00*

U.S. Cl. 19—.46 **9 Claims**

1. A method of producing crimped staple fibers from a crimped filamentary tow, said method comprising pulling said crimped tow by a cutting means through two nips defined by two pairs of idler rolls, prior to cutting said tow, at least one roll of each of said pairs of idler rolls being provided with a patterned surface, said pairs being geared to one another such that the upstream pair is not permitted to rotate at as high a peripheral speed as the downstream pair and such that a differential pulling of said filaments through said nips relative to one another is obtained, thereby deregistering adjacent



filaments, and then cutting said deregistered filaments with said cutting means.

3,898,711

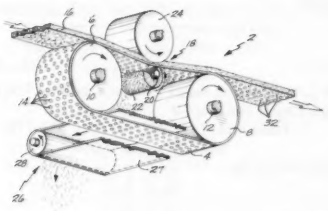
CONTINUOUS SOFT MAT PERFORATOR

Raymond August Van Vliet, Castle Rock, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Oct. 5, 1973, Ser. No. 404,068

Int. Cl.[2] D04H *11/00*

U.S. Cl. 19—161 P **7 Claims**



1. An apparatus for forming apertures in soft mat material at a forming station comprising:

a perforated band adapted to carry the soft mat material on one surface thereof through the forming station, and

a sweeping member positioned at the forming station in engagement with the opposite surface of the perforated band and having means adapted to extend through the perforations and to move faster relative to the perforated band in order to sweep a portion of the soft mat material back through and from the perforations as the mat material is carried through the forming station.

3,898,712

FIBRE CONTROL ARRANGEMENTS FOR TEXTILE DRAFTING SYSTEMS

Reginald Mayman Blackburn, and Harold Edwin Airey, both of Accrington, England, assignors to Platt International Limited, England

Filed Aug. 17, 1973, Ser. No. 389,223

Claims priority, application United Kingdom, Aug. 18, 1972, 38696/72

Int. Cl.[2] D01H *5/86*

U.S. Cl. 19—244 **7 Claims**

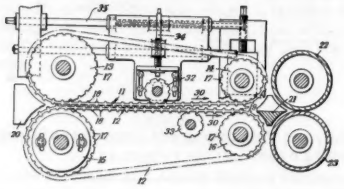
1. A fibre control arrangement for a drafting system for textile fibres comprising:

a first endless conveyor,

a second endless conveyor having a run thereof face-to-face with and adjacent to a run of the first conveyor, said conveyors being mounted for movement at a predetermined speed; the adjacent runs of the conveyors being divided into two stretches, a first stretch in which the conveyors are substantially parallel and a second stretch in which the conveyors diverge, the second stretch fol-

lowing the first stretch in the direction of travel of the conveyors;

a plurality of projections spaced apart along the conveying surfaces of the two conveyors, the projections defining a plurality of depressions therebetween, the projections of the first conveyor registering with the depressions of the second conveyor along the adjacent runs; and



a pair of delivery drafting rollers mounted for rotation at a higher peripheral speed than the speed of the conveyors whereby fibres conveyed between the adjacent runs of the conveyors in a non-linear path are drafted by the conveyors and the delivery drafting rollers, and whereby less control is exercised by the adjacent runs of the two conveyors on textile fibres at the delivery region than at the feed region respectively at opposite ends of said conveyor.

3,898,713

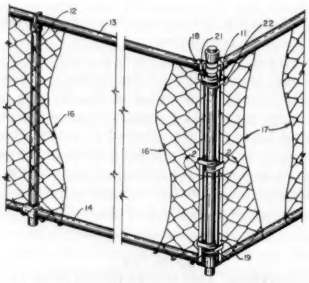
TENSION BAND

Robert L. Nelson, and Susan J. Nelson, both of 756 Orion Ln., Foster City, Calif. 94404

Filed Sept. 17, 1973, Ser. No. 398,174

Int. Cl.[2] A44B *21/00*

U.S. Cl. 24—73 SA **5 Claims**



1. A tension band of the type including a support engaging portion with outwardly extending fingers, the improvement comprising an elongated slot formed near the end of one of said fingers, a locking member formed by bending the end of the other finger towards said one finger, a hook having a neck portion and a head portion at the end of said locking member, said head portion extending farther toward one edge of said other finger than the edge of said slot extends toward the corresponding one edge of said one finger, said head portion formed to extend through said slot, a cam surface extending toward said one edge on the outside edge of said head portion, whereby when said hook engages the edge of said elongated slot in said one finger said cam surface moves said other finger laterally relative to said one finger until said head portion passes through said elongated slot and said head portion springs back in a reverse lateral direction to hook the end of said one finger, whereby said fingers are locked together without tension applied thereto.

3,898,714

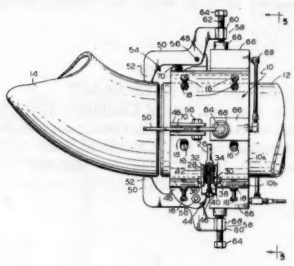
PIPE ALIGNMENT CLAMP

James D. McFadden, 2300 Jefferson Ave., Anchorage, Alaska 99503

Filed Oct. 9, 1973, Ser. No. 404,491

Int. Cl.[2] A44B *21/00;* **B25B** *1/20;* **B23K** *5/22*

U.S. Cl. 24—81 PE **27 Claims**



1. A device for holding two sections of pipe in alignment for welding one to the other, such device comprising:

a circumferential band removably securable to a first of said sections of pipe which is to be welded to a second of said sections of pipe,

movable dogs mounted from said band and having forward ends for securely engaging the second of said sections of pipe, said dogs extending outwardly of the region of the joint between the two pipe sections to permit welding between the pipe sections,

and operating means interengageable between said band and said movable dogs for bringing about the movement of the forward ends of said dogs toward the second of said pipe sections in supporting relation to the second of said pipe sections when said band is removably secured to the first of said pipe sections.

3,898,715

FITTING FOR ADJUSTING A SAFETY BELT

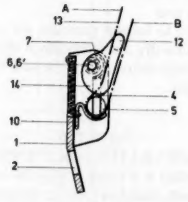
Arnold Balder, Wasbuttel, Germany, assignor to Klippan GmbH Hamburg, Hamburg, Germany

Filed Apr. 17, 1974, Ser. No. 461,676

Claims priority, application Germany, Apr. 21, 1973, 2320314

Int. Cl.[2] A44B *11/00*

U.S. Cl. 24—196 **7 Claims**



1. A device for adjusting a belt, especially a safety belt for use in motor vehicles and the like, which device comprises a U-shaped housing with a base mounted to the vehicle, said housing provided with a non-rotatable clamping roller, surrounded at least partially by a shaped part, said roller longitudinally displaceable in said housing in slots in the direction in which the belt is pulled, a belt laid around the clamping roller with the slots extending parallel to the base of the housing, bores located in the housing, a locking roller offset from the slots rotatably mounted in the bores and connected to and

rotating with a rocking lever, the arms of which each have a control cam face cooperating with the clamping roller.

3,898,716

ROTATABLE STOP FASTENER

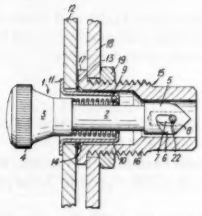
John F. Aylott, Frimley, England, assignor to Dzus Fastener Co. Inc., West Islip, N.Y.

Filed Jan. 31, 1974, Ser. No. 438,472

Claims priority, application United Kingdom, Feb. 1, 1973, 5127/73

Int. Cl.² A44B *17/00*

U.S. Cl. 24—221 K **5 Claims**



1. A quick acting fastener which is locked by longitudinal reciprocation of one of the fastening members comprising:

a cylindrical socket member having a cross pin extending diametrically thereacross and also having means for fixedly attaching it to a part to be fastened;

a stud member having a head portion at the rear end and a relatively reduced shank portion at the forward end and also having means for attaching it to another part to be fastened for both axial and rotary motion, said stud member having at its forward end a pair of generally straight inclined portions meeting along a generally straight line at the terminal end of said stud member, a slot extending through said inclined portions transversely of said line and open at the forward end, and having extending rearwardly from said slot a pair of diametrically opposed cam slots, a locking shoulder on the forward wall of the cam slots for locking engagement with the cross pin upon rotation of the stud member, the wall forming each cam slot portion opposite the shoulder tapering axially rearwardly from the shoulder from a point substantially opposite to the shoulder and to a point circumferentially beyond the shoulder, so that axial reciprocation of the stud by pressing on the head causes the camming surfaces to engage the cross pin to rotate the stud member and cause the cross pin to have locking engagement with the cam slots; and

a compression spring surrounding the shank of the stud to normally urge the stud member away from the socket member.

3,898,717

RELEASABLE PAPER CLIP

Hermann Schwartz, Pfaffikon, Switzerland, assignor to Siegfried Peyer, Basch, Switzerland

Filed Oct. 9, 1973, Ser. No. 404,608

Claims priority, application Switzerland, Oct. 10, 1972, 14767/72

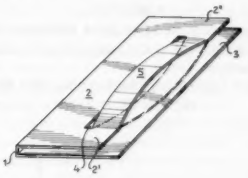
Int. Cl.² A44B *21/00*

U.S. Cl. 24—259 **4 Claims**

1. A releasable paper clip comprising

a piece of stiff resilient sheet material bent or folded over in substantially U-shaped profile, the legs of the U being not necessarily of the same length and providing an upper and lower guide faces for a paper sheet or stack that may be inserted into the clip,

one of said guide faces (**2**) having at least one slit (**4**) substantially parallel to the fold (the bottom of the U) (**1**), said slit(s) together with the edge portions (**2'**, **2''**) of said guide face beyond the end(s) of said slit(s) forming boundaries of an arched strip (**5**) of said sheet material bowed out of the plane of said guide face and connecting



with said edge portions in said plane at its ends, said arched strip constituting a bistable spring element in one stable position of which the arched strip (**5**) applies pressure against the opposite guide face (**3**) and in the other position of which the arched strip (**5**) is wholly outside the space between said guide faces (**2**, **3**).

3,898,718

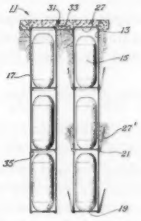
APPARATUS FACILITATING BURIAL IN THE VERTICAL POSITION

Marcus P. Eubank, P.O. Box 7576, Longview, Tex. 75601

Filed Dec. 3, 1973, Ser. No. 421,043

Int. Cl. A61g *17/00*; **E04h** *13/00*

U.S. Cl. 27—35 **5 Claims**



1. A burial structure comprising:

a. a plurality of vertically oriented burial bores;

b. a plurality of respective casings disposed in respective bores, said casing being adapted to receive a plurality of vertically oriented corpse containers and being sealingly connected with a bottom end and sealed against influx of water;

c. removable top lids connected with the top of respective said casings for allowing access to the interior of said casing within said bore;

d. individual supports disposed at a plurality of respective levels within respective said casings for supporting said corpse containers individually within each said casing; and

e. a plurality of corpse containers having corpses therewithin and disposed in vertical orientations within respective said casings within respective said bores on respective said individual supports; said corpse containers including foamed plastic loosely conformably fitting both front and back of said corpse therewithin for supporting said corpse in a vertical position; said corpse containers comprising a high density plastic skin that is unitary with a foamed plastic interior; said high density skin and said foamed plastic interior being sealable about a corpse before being disposed vertically in said casing within said bore; said foamed plastic traversing both in front of and in back of said corpse and extending to meet and mate

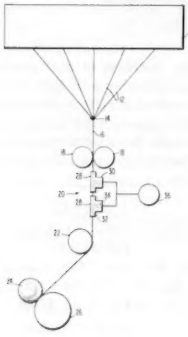
with the foamed plastic in the opposite half when said corpse container is closed about said corpse such that sealant can be disposed on the mating surfaces of said foamed plastic, as well as said high density skin, to seal said corpse container.

3,898,719

METHODS AND APPARATUS FOR INTERLACING YARN

Neil E. Lloyd, Rock Hill, S.C., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 20, 1974, Ser. No. 452,890
Int. Cl. D02g *1/16*
U.S. Cl. 28—1.4 **23 Claims**



1. Yarn interlacer apparatus for subjecting a bundle of yarn filaments to turbulent fluid movement such that the filaments become compacted and interlaced, the interlacer apparatus comprising:

means defining a yarn processing bore having yarn inlet and outlet ends;

means for passing a continuous bundle of yarn filaments through said yarn processing bore; and

means for establishing, in said bore, separately traveling fluid flows generating a plurality of shock wave formations which extend completely across the path of travel of said yarn filaments such that said filaments pass through and continuously contact said shock wave formations and become compacted and interlaced thereby.

3,898,720

METHOD OF PROVIDING A FLUORESCENT LAMP STEM WITH AN INTEGRAL MERCURY-VAPOR PRESSURE REGULATING MEANS

Chalmers Morehead, Upper Montclair, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

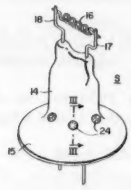
Division of Ser. No. 293,239, Sept. 28, 1972. This application May 28, 1974, Ser. No. 473,959
Int. Cl. H01j *9/18, 7/18, 7/26*
U.S. Cl. 29—25.13 **9 Claims**

1. In the manufacture of a glass stem assembly for a low-pressure electric discharge lamp of a type that is dosed with a controlled amount of mercury after the stem assembly is sealed to the lamp envelope, the method of providing said stem assembly with integral means for controlling the mercury-vapor pressure within the finished lamp, said method comprising the steps of:

forming a compact body of a metal that has a melting point below the softening point of the glass stem assembly and combines with mercury to form an amalgam,

heating the glass stem assembly to a temperature above the melting point of the amalgamative-metal,

placing the body of amalgamative-metal in contact with the surface of the heated stem assembly until the metal body is fused to the stem assembly, and then



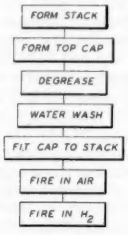
maintaining the metal body and stem assembly in such position until they cool and the metal body rigidifies and is secured to the stem assembly.

3,898,721

DIFFUSION BONDED CATHODE FOR ELECTRON DISCHARGE DEVICE

John J. Decker, and Donald R. Kerstetter, both of Emporium, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 18, 1973, Ser. No. 361,830
Int. Cl.[2] H01J *9/00;* **B23K** *31/02*
U.S. Cl. 29—25.14 **2 Claims**



1. A method of fabricating cathodes for electron discharge devices, said cathodes comprising a hollow tubular stack and a substantially cup-shaped top cap fitted over one end of said stack and affixed thereto, said method comprising the steps of: forming said tubular stack from a nickel alloy containing at least about 95% nickel; forming said top cap from a nickel alloy containing at least about 95% nickel; said top cap having an internal diameter just large enough to fit over the external diameter of said stack; cleaning said stack and said top cap; drying said stack and top cap; fitting said top cap onto said stack to form a cathode assembly; firing said assembly in air to oxidize any volatile contaminants thereon at a temperature of above about 500°–600°C; and firing said assembly in a reducing atmosphere at a temperature sufficiently high to form a diffusion bond between said top cap and said stack, said cathode assembly reaching a temperature of about 1,100°C for at least one minute during said firing in said reducing atmosphere.

3,898,722

PROCESS FOR FORMING AN ELECTRODE

D. Paul Foote, Sierra Madre, Calif., assignor to Xerox Corporation, Stamford, Conn.

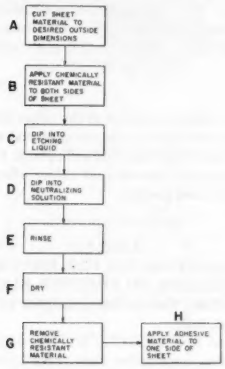
Filed Apr. 2, 1973, Ser. No. 347,277
Int. Cl. H01g *13/00*
U.S. Cl. 29—25.42 **4 Claims**

1. A method for forming an electrode for use in a cassette for enclosing in a light-tight environment a photoconductor layer formed on a conductive substrate, said photoconductor layer having a latent electrostatic charge formed thereon, said

cassette including lid and bottom portions, said photoconductor layer being supported in the bottom portion and said electrode being affixed to the lid portion of said cassette, said method comprising the steps of:

a. cutting a starting material comprising a layer of dielectric material sandwiched between two electrically conductive surfaces to a predetermined size such that the starting material may be affixed to said lid portion,

b. applying an etchant resistant material to selected portions of both conductive surfaces, said selected portions corresponding to a desired electrode pattern,



c. subjecting the starting material to an etchant whereby the non-selected portions of the conductive surfaces are removed from the starting material,

d. removing the starting material from the etchant,

e. removing the etchant resistant material from said starting material, and

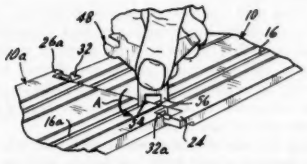
f. applying an adhesive material to one of the conductive surfaces and affixing the starting material to said cassette lid.

3,898,723

MODEL VEHICLE RACETRACK TOOL

James S. Kirby, Huntington Station, and Louis Accornero, Hempstead, both of N.Y., assignors to Aurora Products Corporation, West Hempstead, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,009
Int. Cl.[2] B23P *19/00*
U.S. Cl. 29—200 H **9 Claims**



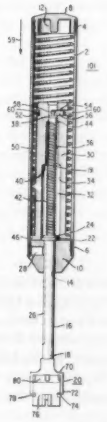
1. A tool for use in assembling and disassembling like adjacent track sections for model vehicles, each of said track sections including a longitudinally extending body of insulating material having two ends, said track section having a substantially flat top wall forming a running surface for said model vehicles and including a guide groove of substantially equal longitudinal extent with said track section for use in guiding model vehicles, said guide groove having generally upstanding side walls depending from said track section top wall, a projection from each end of said track section, a laterally extending hook being fixed to each of said projections, said hooks facing in laterally opposite directions, a recess in each end of said track section constructed and arranged to receive a corresponding projection of a like adjacent track section, a hook retaining means at each end of said track section and spaced from the end thereof for releasably engaging a corresponding laterally extending hook of a like adjacent track section, and detent means located on each end of said track section for coacting with corresponding detent means of an interconnected like adjacent track section for normally maintaining an aligned relationship of said guide grooves of said two like adjacent interconnected track sections, each corresponding hook and hook retaining means including means for urging like adjacent, in registration, track sections toward one another and into engagement in response to the application of oppositely directed lateral forces thereto thereby overriding coacting corresponding detent means of said adjacent track sections, said tool comprising a gripping section for use in holding said tool, a track engaging member fixed to said gripping section and at least one lever arm fixed to said gripping section for use in applying a turning force to said tool, said track engaging member including two depending spaced legs, each of said legs being constructed and arranged to be inserted within a guide groove of one of said track sections in a given direction and rotatable therein in a direction orthogonal to said given direction, said legs being fixed relative to said gripping section so that a turning force applied to said gripping section in said orthogonal direction causes said legs to rotate in said orthogonal direction, said legs being spaced apart a distance sufficient to permit a simultaneous insertion of each of said legs within the respective guide grooves of each of two of said adjacent track sections with corresponding hooks and hook retaining means arranged in registration, said tool being usable to translate said orthogonal turning force applied to said tool into said oppositely directed lateral force on said track sections by coaction between said spaced legs and a side wall of said respective guide grooves of said adjacent track sections.

3,898,724

IMPACT TOOL

Theodore Alan Conorich, East Orange, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 11, 1974, Ser. No. 522,329
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—203 H **11 Claims**



1. A tool adapted for terminating wires in bifurcated terminals comprising a head for contacting said wires, a plunger on which said head is mounted for moving said head with respect to said terminals, and an impact mechanism for impacting said

plunger to thereby apply forces to said head to terminate said wires characterized in that said impact mechanism includes:

a hammer having an internal passageway therethrough to receive said plunger therein, said plunger includes a flange thereabout and said passageway includes a shoulder around the periphery thereof adapted to impact said flange;

a power spring surrounding substantially the entire length of said hammer for imparting a force to said hammer for impacting said plunger; and

a return spring about said plunger within said passageway for returning said plunger to an initial position after said impacting.

3,898,725

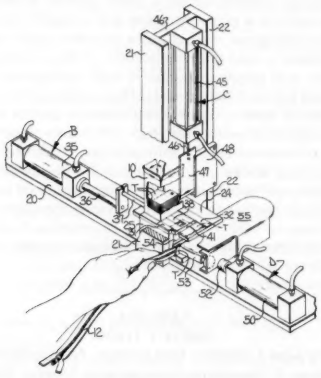
APPARATUS FOR APPLYING HANG TABS TO ZIPPERS

Joseph V. Carter, II, Shelby, N.C., assignor to Lily Mills Company, Shelby, N.C.

Filed Dec. 10, 1974, Ser. No. 531,237

Int. Cl.[2] B23Q *7/10*

U.S. Cl. 29—211 R **8 Claims**



1. An apparatus for appplying hang tabs to zippers comprising

a. a magazine for supporting a stack of hang tabs in flat condition,

b. means for successively removing the bottom hang tab from the stack and moving the same to an adjacent folding station,

c. means for folding the hang tab along a line extending through the medial portion of the tab to provide a pair of legs of substantially equal length and for maintaining the hang tab in this folded condition to receive the end of a zipper between the legs thereof, and

d. means for applying a staple through the legs of the hang tab and the end of the zipper positioned therebetween to connect together the legs of the hang tab and to secure the end of the zipper therebetween.

3,898,726

METHODS AND DEVICE FOR POSITIONING AND ASSEMBLING FREE-FITTING PARTS

Jean Godart, and Guy Faure, both of Billancourt, France, assignors to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France

Filed June 18, 1973, Ser. No. 370,650

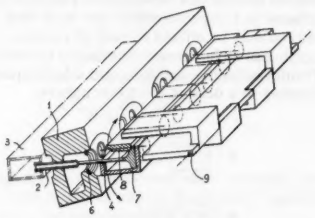
Claims priority, application France, July 25, 1972, 72.26705

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—213 **1 Claim**

1. A device for assembling valves in an internal combustion engine having hollow valve guides for receiving the stems of said valves comprising:

positioning means for placing said valve stems in alignment with and in close proximity to one end of said valve guides including a valve support having collapsible holding members; and



means for creating a vacuum at the other end of said hollow valve guides so that by said vacuum said stems are sucked into said hollow guides, said collapsible holding members being adapted to release said valves after said valves are sucked into said guides.

3,898,727

METHOD AND APPARATUS FOR JOINING A FLEXIBLE WAVEGUIDE TO ANOTHER ELEMENT

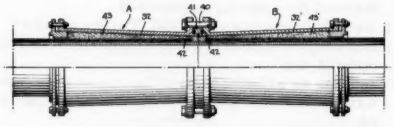
Antonio Ferrentino, Monza, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Dec. 20, 1973, Ser. No. 426,495

Claims priority, application Italy, Feb. 2, 1973, 19943/73

Int. Cl. H01p *11/00*

U.S. Cl. 29—600 **5 Claims**



1. A method for joining a flexible waveguide having a cylindrical inner surface and forming part of a telecommunication line to another element of said line having a similar cylindrical inner surface comprising:

inserting a first portion of an accurately sized, rigid body within said cylindrical surface of said waveguide, said portion being expandible in diameter and said body having a second portion exteriorly of said waveguide which is accurately aligned with respect to the axis of said expandible portion,

expanding said first portion of said body into contact with said cylindrical inner surface of said waveguide,

positioning a first hollow securing member around the exterior of said waveguide at the end thereof said member having an interior size greater than the exterior size of said waveguide to permit adjustment thereof with respect to the axis of said waveguide,

aligning the axis of said member with said axis of said second portion of said body and hence, with the axis of said cylindrical inner surface of said waveguide,

securing said member to said waveguide with said axis of said member so aligned,

similarly positioning, aligning and securing on the exterior and at the end of said element a second hollow securing member of an interior size greater than the exterior size of said element to secure said second member to said element with its axis accurately aligned with the axis of said cylindrical inner surface of said element,

each of said securing members having means for accurately aligning the axis of one thereof with the axis of the other thereof,

after removal of said body, bringing said end of said waveguide adjacent to said element without a gap therebetween and aligning the axis of said waveguide with the axis of said element by aligning the axes of said first and second securing members with the use of said aligning means thereof, and

securing said first member to said second member with their axes so aligned by releasable securing means.

3,898,728

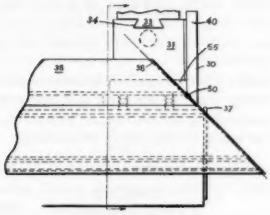
JOINING OF TUBULAR SECTIONS

Paul E. Rousseau, Brussels, Belgium, assignor to Sadacem Societe Anonyme, Brussels, Belgium

Continuation-in-part of Ser. No. 260,259, June 6, 1972. This application May 21, 1973, Ser. No. 362,459

Int. Cl. B23p *11/02*

U.S. Cl. 29—446 **4 Claims**



1. In a method for forming a miter joint between mating ends of sections having at least one tubular element wherein a right angle connector of a width and thickness slightly less than the internal dimensions of the tubular elements and with opposite arms bearing longitudinal slits extending substantially along said arms with a small web therebetween is positioned within the tubular elements of said sections to bridge the juncture of the joined sections and the slit halves of each arm are wedged outwardly into expansion with three of the internal walls of the tubular elements by pins driven transversely through the walls of the sections and into said slits, the improvement for securing a precise alignment between the joined sections which comprises: positioning one of the arms of the connector in the tubular element of a first section at a position therein past its intended joint line, securing said connector in the tubular element of the first section by driving at least one metal pin through a wall of the first section and the slit halves of said arm to expand said slit halves of said arm into a three-walled contact with the internal walls of said tubular element and thereafter positioning the second section on the remaining arm of said connector, applying a force, axially, to said second section to compress said sections and draw said connector into precise alignment on the juncture plane of said joined sections and thereupon driving at least one metal pin through the wall the the second section to enter the slit of the connector's remaining arm and expand its halves outwardly into binding engagement with the internal walls of the second section

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3,898,729

METHOD OF MAKING DRILL PROOF PLATE FOR SAFES

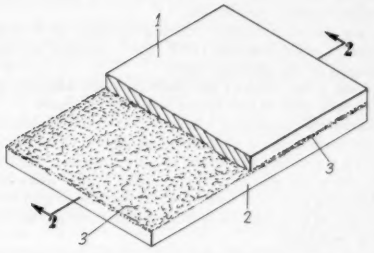
Charles H. Greene, Cincinnati, Ohio, assignor to Ohio Knife Company, Cincinnati, Ohio

Division of Ser. No. 659,828, June 8, 1967, Pat. No. 3,807,970, which is a continuation of Ser. No. 395,127, Sept. 9, 1964. This application Feb. 1, 1974, Ser. No. 438,741

Int. Cl.[2] B23K *31/02*

U.S. Cl. 228—122 **8 Claims**

1. A method of manufacturing a plate structure comprising the steps of providing at least two metallic sheets, arranging said sheets to form a laminated structure, preforming a thin uniformly distributed layer of abrasive particles on a carrier web, utilizing said carrier web to locate said abrasive particle



layer between adjacent surfaces of said sheets and fusing said sheets together to form a unitary plate structure with said particles embedded in the line of fusion between said sheets.

3,898,730

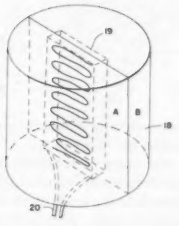
BONDING METHOD IN THE MANUFACTURE OF CONTINUOUS REGRESSION RATE SENSOR DEVICES

William H. Haraway, Jr.; Walter J. Dale, and Edwin A. McErlean, all of Hampton, Va., assignors to The United States of America as represented by the United States National and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Dec. 12, 1973, Ser. No. 424,038

Int. Cl. H01c *1/02*

U.S. Cl. 29—613 **3 Claims**



1. A method of making a continuous regression rate sensor device comprising:

machining a first retaining member for a rate sensor grid from an ablative material selected from the molded group consisting of 50:50 by weight phenolic-nylon material and a phenolic-carbon-fiber reinforced compound having a fifty percent resin content,

machining a second retaining member for the sensor grid from the same material as said first retaining member,

each of said first and said second retaining members being machined so as to provide mating surfaces on at least a portion of the exterior thereof,

each of said first and said second retaining members being further machined to provide a mating recess in the respective mating surfaces thereof of such dimension as to receive a sensor grid therein when the two retaining

members are positioned with the mating surfaces thereof abutting each other,

applying a thin coating of a liquid phenolic resin to the area of said mating surface of each said first and second retaining members that encompasses the recess therein and drying the coated surfaces at ambient temperature for approximately 30 minutes,

heating the resin coated retaining members at a temperature of approximately 185°F. for 5 minutes to effect B staging of the phenolic resin,

applying a thin coat of the phenolic resin adhesive to the recessed area of one of the retaining members,

immediately positioning a sensor grid in the coated recess and permitting the phenolic resin adhesive to dry at ambient temperature to thereby acquire sufficient "tackiness" to retain the grid in position during further assembly,

connecting electrical lead wires to the sensor grid of such length as to extend away from the first and second retaining members,

placing said first and said second retaining members in abutting relationship with the sensor grid positioned therebetween

securing said first and said second retaining members together and heating the secured unit at a temperature of approximately 330°F. to thereby cure the phenolic resin adhesive and bond the first and second retaining members into a unitary structure containing the sensor grid with lead wires extending therefrom.

3,898,731

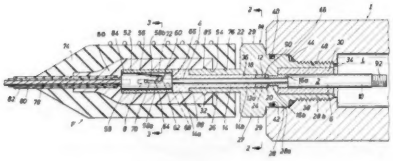
METHOD OF MAKING ELECTRICAL CONNECTORS

Sandiford Ring, and Russell K. Ring, both of P.O. Box 14666, Houston, Tex. 77021

Division of Ser. No. 249,359, May 1, 1973, Pat. No. 3,793,608. This application Nov. 30, 1973, Ser. No. 420,388

Int. Cl.[2] H02G *15/00*

U.S. Cl. 29—629 **2 Claims**



1. A method for producing a male member for an electrical connector comprising the steps of:

a. assembling said male member having a pin, a sealing annulus circumferentially surrounding a first portion of said pin intermediate the ends thereof, a pair of refractory sleeves circumferentially surrounding other portions of said pin on opposite sides of and adjoining said annulus, and a metal jacket circumferentially surrounding said annulus and portions of said sleeves directly adjacent said annulus;

b. heating said male member by induction heating, such that said jacket is selectively heated at a greater rate than said annulus and said sleeves;

c. cooling said male member sufficiently slowly to allow annealing of said annulus.

3,898,732

DRY SHAVER

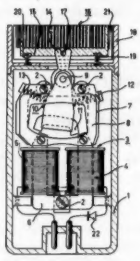
Erich Krainer, Klagenfurt, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1974, Ser. No. 450,765

Int. Cl.[2] B26B *19/02, 19/28;* **H02K** *33/00*

U.S. Cl. 30—43.92 **8 Claims**

1. In an electric shaver operable with an AC supply variable between 50Hz and 60Hz, and including a vibrator type electric motor having a stator with wire windings thereon, and a damped mechanical vibration system comprising an armature, spring means, and a reciprocatable cutter, said system having a normal oscillation frequency of twice the supply frequency,



the improvement wherein said vibration system has a resonant frequency higher than 60 Hz, and said apparatus comprises means for establishing the oscillation frequency of the vibration system as equal to the supply frequency.

3,898,733

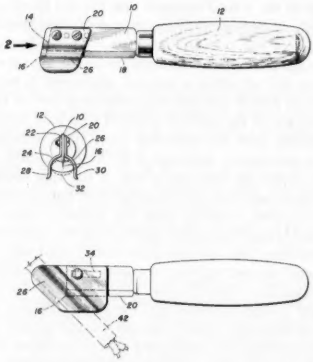
CABLE STRIPPER

Joseph Tilmon Cormier, 1130 Main St., Tewksbury, Mass. 01876

Filed Aug. 5, 1974, Ser. No. 494,560

Int. Cl.[2] B21F *13/00;* **B26B** *29/02*

U.S. Cl. 30—90.4 **6 Claims**



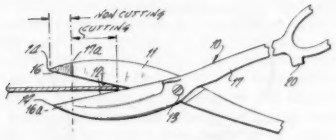
1. A cable stripper comprising a straight edged blade having a handle at one end, the blade having a longitudinally extending straight cutting edge and a free end forming a generally square stripping point with the cutting edge of the blade,

and a cable guide mounted in fixed relation on said blade, the guide comprising a pair of plates one at either side of the blade covering the stripping point, said plates each being provided with a flat portion secured to the blade and extending outwardly away from each other in the region of the stripping point, terminating in terminal portions which are substantially parallel to each other, the stripping point projecting from the bottom of the guide at a point where the outwardly extending portions merge with the flat portions attached to the blade, said stripping point being wholly within the guide.

3,898,734
SHEARS

Jess Dorkin, 1340 S. Ocean Blvd., Pompano Beach, Fla. 33062

Filed Mar. 29, 1974, Ser. No. 456,150
Int. Cl.[2] B26B *13/06*
U.S. Cl. 30—233 5 Claims

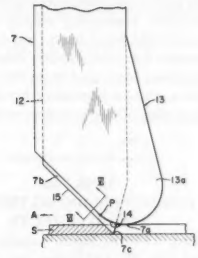


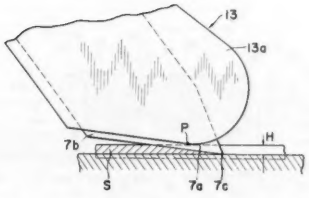
1. A shears comprising two elongated handle members, a pivot member coupling the handle members is swingable relationship to each other, a cutting blade on one end of each handle member having a generally planar innerface, said blades being in juxtaposition, a blade tip at the end of the blade opposite the handle member, a cutting edge on each blade adapted to receive a work part therebetween, said blade tips having an edge integral with the cutting edge of the blade and extending away from the planar face of the blade.

3,898,735
KNIFE FOR CUTTING OUT CLIPPINGS

Shohachi Himeno, Tokyo, Japan, assignor to Conde Kabushiki Kaisha, Japan

Filed May 9, 1973, Ser. No. 358,809
Int. Cl.[2] B26B *3/00, 29/02*
U.S. Cl. 30—294 4 Claims



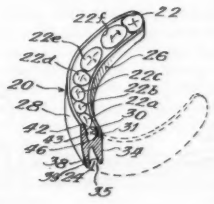


1. A knife for cutting out clippings from a sheet of paper, comprising a knife blade of generally planar shape and having a contact surface substantially perpendicular to the plane of the blade for sliding contact with a surface of the paper and a cutting edge disposed in the vicinity of said contact surface and extending beyond the contact surface by a cutting depth distance, said contact surface having a contour of a convex fair curve, when viewed in the direction perpendicular to the plane of the blade, of a large radius of curvature, the relationship between the dimensions and shapes of said contact surface and the cutting edge being so selected that the depth of cut of the cutting edge into the paper can be adjustably varied by varying the angular attitude of the knife blade relative to the paper, said contact surface having a contour of a convex fair curve formed by an edge surface of a bulbous projection extending rearwardly with respect to the cutting direction of the knife, the blade piece in planar view having two long sides and at least one short side at an acute angle to one of the long sides, the short side forming a straight cutting edge with a cutting tip at the vertex of the acute angle, the contact surface being parallel to the cutting edge for a major portion of the length of the cutting edge then rising arcuately from a point slightly forwardly of the cutting tip with respect to cutting advance of the knife and extending rearwardly of the cutting tip along the arc progressively departing thereby from the straight line portion parallel to the cutting edge, the cutting edge extending beyond the contact surface along the parallel portion by a cutting depth distance corresponding to the small thickness of a single sheet of paper, whereby when the knife is held at an angle to the surface of the paper with the parallel portion of the contact surface in contact with the paper, the cutting edge is limited by said contact surface portion to cut the paper only to a depth substantially equal to its thickness, the arcuate portion of the contact surface being such that for varying thicknesses of single sheets of paper the knife may be tilted progressively rearwardly to cut increasing thicknesses of single sheets of paper, the use of the knife in upright attitude to the paper positioning a portion of the arcuate portion of the contact surface in sliding contact with the paper at a point rearwardly of the cutting tip with respect to cutting advance of the knife.

3,898,736
ORTHODONTIC APPLIANCE AND METHOD OF USING SAME

Earl O. Bergersen, 950 Linden Ave., Winnetka, Ill. 60093

Continuation-in-part of Ser. No. 614,723, Feb. 8, 1967. This application June 30, 1969, Ser. No. 837,667
Int. Cl. A01c *7/00*
U.S. Cl. 32—14 B 5 Claims



1. The method of positioning teeth comprising the steps of: providing a limited number of preformed resilient tooth positioning appliances of different preselected standard configuraion and dimension; measuring the oral cavity of the patient to determine the applicable standard size appliance for that patient; selecting such an appropriate standardized size appliance from the preformed group provided; and inserting the selected appliance into the patient's mouth in bite abutting position.

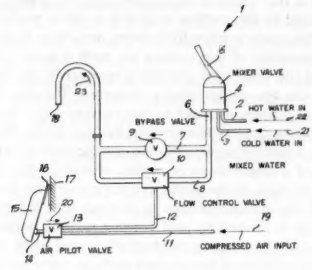
3,898,737
DENTAL SPIGOT CONTROL DEVICE

Raymond Cope, 3541 Springvalley Rd., Birmingham, Ala. 35223

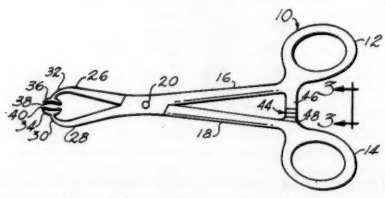
Filed July 30, 1973, Ser. No. 383,978
Int. Cl.[2] A61C *19/02*
U.S. Cl. 32—22 7 Claims

1. A dental spigot device comprising in combination: a water conduit means including at least one water-receiving

conduit and in series therewith a flow control valve and a water outlet, fluid control means for controllably preventing outflow of water from said outlet, and fluid switch means for turning off and on fluid to said fluid control means, said fluid control means being responsive to fluid turned off and on by said fluid switch means, said fluid switch means including respective conduits receivable of pressurized fluid and operatively connecting the fluid switch thereof to the fluid control means, and said fluid switch means further including manual actuation lever therefor, and in series between the water-receiving conduit and the flow control means, there being a mixer valve means receivable of conduits for each of hot and cold water delivery separately thereto, with a unitary outlet to the flow control means.



3,898,738
DENTAL INSTRUMENT
John E. Linder, 5039 Winding Branch Dr., Atlanta, Ga. 30338
Filed Dec. 10, 1973, Ser. No. 423,511
Int. Cl. A61c *11/02*
U.S. Cl. 32—41 **7 Claims**



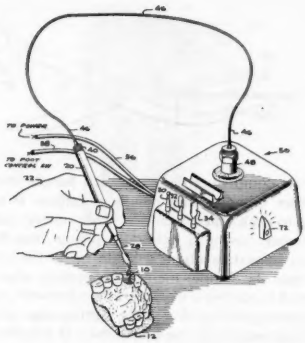
1. In a dental instrument for grasping a dental crown and the like which has a shape and surface similar to a tooth:

a. a scissors comprising a pair of movable members each having a tip opposed to and spaced from the other,

b. manually operated scissors handles on the respective members on said instrument for moving the tips of said members towards or away from each other selectively to grasp or release a crown and the like therebetween,

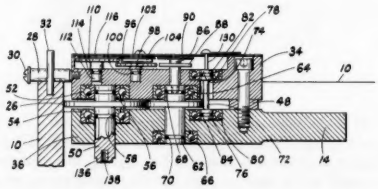
c. and a small cushioned and contoured pad affixed to each tip in opposed relationship on said tips, said pads being shaped to fit the opposite exterior of a crown and the like, whereby a dental crown and the like may be grasped by pressure on said handles from the hands causing said movable members to close said pads on said crown and the like and be held in place during fitting and cementing.

3,898,739
VIBRATING DENTAL PACKER
Donald W. Gayso, 1092 Perkins Ter., Memphis, Tenn. 38117
Filed Feb. 16, 1973, Ser. No. 332,817
Int. Cl. A61c *3/08*
U.S. Cl. 32—53 **9 Claims**



1. Hand operated apparatus for enabling the application of damp or dry powdery material into a working area and for subsequently enabling uniform compacting of the powdery material in the working area, said apparatus comprising a main vibration power source comprising an electric vibrator having a physically movable output member providing mechanical vibrations, a rigid pencil-shaped hand piece having first and second ends, accessory tip mounting means connected to said first end of said hand piece for fixedly connecting an accessory tip to said hand piece and a flexible wire-like mechanical vibration conveying means extending between said second end of said hand piece and said physically movable output member for continuously conducting a sufficient quantum of vibrations from said main vibration power source to said hand piece and an accessory tip mounted thereon to enable the compacting of said powdery material by said accessory tip.

3,898,740
APPARATUS FOR DETERMINING THE DIAMETERS OF ROUND OBJECTS
Albert L. Mefford, 1120 E. Jones, Sapulpa, Okla. 74066
Filed Jan. 19, 1973, Ser. No. 325,212
Int. Cl. G01b *3/12, 5/08*
U.S. Cl. 33—142 **1 Claim**



1. Apparatus for measuring the diameter of a circular object comprising a measuring device adapted to bear against and move along the surface whose diameter is to be measured, a measuring roller mounted on a first shaft for rotation in said measuring device and having a diameter exactly equal to a multiple or sub-multiple of the standard of measurement in which the diameter is to be expressed, said measuring wheel being adapted to move circumferentially exactly the same amount as the movement of said measuring device over the

full circumference of the surface whose diameter is to be measured, means for translating the number of revolutions of said measuring roller into the exact diametral measurement of said object, a second shaft mounted for rotation in said measuring device, a contacting roller mounted on said second shaft and having an outer periphery adapted to contact said surface and contacting the outer periphery of said measuring roller whereby said contacting roller is in driving relationship with respect to said measuring roller, a third shaft mounted for rotation in said measuring device, a second measuring roller keyed to said third shaft and having its outer periphery engaging the outer periphery of the first mentioned roller whereby said first measuring roller is in driving relation with respect to said second measuring roller, the diameter of said second measuring roller being an exact sub-multiple of the diameter of said first measuring roller, wherein the shaft of said first measuring roller and the shaft of said contacting roller are mounte ' respectively in bearings in said measuring device where the center-to-center distance between these respective bearings is slightly less than the combined radial measurements of said contacting roller and said first measuring roller and wherein the shaft of said second measuring roller is mounted for rotation in a bearing in said measuring device, the center-to-center distances between the bearings for the shafts of said first and second measuring rollers being slightly less than the combined radial measurements of said first and second measuring rollers, all of said shafts being resiliently mounted in their respective bearings, whereby positive contact is assured in said driving relationships.

3,898,741

MEASURING APPARATUS

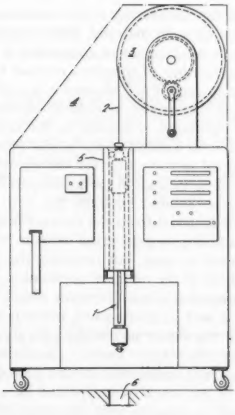
Wilfred Casey, Preston, England, assignor to British Nuclear Fuels Limited, Lancashire, England

Filed Apr. 8, 1974, Ser. No. 459,228

Claims priority, application United Kingdom, May 21, 1973, 24214/73

Int. Cl.[2] G01B *5/12*

U.S. Cl. 33—178 F **11 Claims**



1. Measuring apparatus for making measurements within a downwardly extending channel, the apparatus comprising an elongated probe, a probe support means for suspending the probe within the channel at successive stepwise points therealong, an electrical conductor associated with the probe support means, a measurement indicator connected to the conductor exteriorly of the channel, the probe including an anchorage means for the probe support means, a track which extends parallel and stationary relative to to the longitudinal axis of the probe, a carriage captive on the track and movable therealong, a measuring transducer mounted on said carriage and having an electrical output connected electrically to the conductor and means for moving the carriage along the track to take measurements while the probe is stationary.

3,898,742

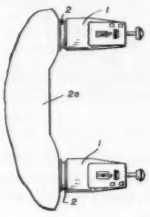
HEADLIGHT TESTING APPARATUS

Wayne E. Hunnicutt, Rt. 1, Box 445, Big Bend, Wis. 53103

Continuation of Ser. No. 171,873, Aug. 16, 1971, abandoned. This application Feb. 19, 1974, Ser. No. 443,868

Int. Cl. G01c *15/12*

U.S. Cl. 33—288 **14 Claims**



1. An apparatus for testing the adjustment of a headlamp of a vehicle resting on a support surface comprising

a housing including securement means adapted to secure the housing to the lens of a headlamp of a vehicle with the longitudinal axis of the housing coinciding to the longitudinal axis of the headlamp,

a spirit level mounted on the housing with its longitudinal axis parallel to the longitudinal axis of the housing in a horizontal plane,

adjustment means coupled to the spirit level for shifting the longitudinal axis of the spirit level relative to the housing to a horizontal orientation while the housing is positioned on the support surface with its longitudinal axis parallel to the longitudinal axis of the vehicle,

said spirit level being shifted by the adjustment means indicating the degree of vertical adjustment of the headlamp upon the housing being secured to the headlamp,

said vertical orientating means including a sight means having an optical path oriented longitudinally of the housing for indicating the relative alignment of the longitudinal axis of the housing to the slope of the ground prior to attachment to the headlamp,

said sight means including an opening positioned on an end of the housing and a second opening positioned on the top of the housing,

the housing further includes lateral sight means to indicate the horizontal alignment of the headlamp, and

the lateral sight means having an optical path including a view opening to provide an image external of the housing and further including a second opening positioned on said housing in confrontation to an external target, and

said lateral sight means including a sight member and a sight element coupled to the housing and lying in spaced relationship along said optical path.

3,898,743

PIPE TARGET ASSEMBLY

Rudolph S. Myeress, Richmond Heights, Ohio, assignor to Allied Steel & Tractor Products, Incorporated, Cleveland, Ohio

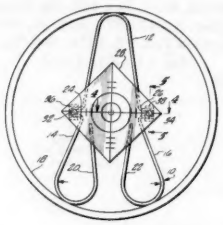
Filed Nov. 1, 1973, Ser. No. 412,006

Int. Cl. G01c *15/06*

U.S. Cl. 33—293 **11 Claims**

1. A target assembly for defining a point on the centerline of a pipe, comprising:

a resilient frame formed from a wire defining three points of contact for engaging the inner wall of a pipe said three points lying in a plane which is generally perpendicular to the axis of the pipe, said resilient frame being capable of deflecting symmetrically when subject to symmetrical compression loading;



a target; and

means for mounting said target centrally on said resilient frame, said means allowing symmetrical deflection of said frame when said frame is subjected to symmetrical compression loading.

3,898,744

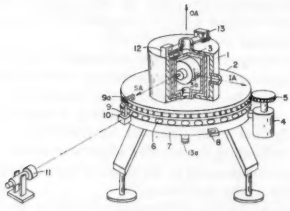
CONSTANT PRECESSED GYROCOMPASS

James V. Johnston, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 303,896, Nov. 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 855,468, Sept. 3, 1960, abandoned. This application Feb. 12, 1974, Ser. No. 441,928

Int. Cl.[2] G01C *19/36*

U.S. Cl. 33—324 **3 Claims**



1. A constant precessed gyrocompass including: a level platform about a first axis; an integrating gyro mounted on said platform and including an outer housing fixed to said platform and an inner cylinder carrying the rotor of said gyro, said inner cylinder, rotatable with respect to said outer housing parallel to the plane of said platform, said gyro having an input axis, and an output axis, and a spin axis of said rotor, with said spin axis and said input axis in a plane parallel to said platform, and said output axis coincident with said first axis; means for providing output pulses when said gyro inner cylinder exerts a torque about its output axis, with the polarity of said pulses dependent on the direction of said torque; means for rotating said inner cylinder of said gyro with respect to said outer housing in response to said output pulses, whereby said inner cylinder of said gyro tends to maintain a predetermined angular relationship with said outer housing and said platform as the platform rotates; adjustable means for providing a position pulse for each revolution of said platform; means connected both to said means for providing output pulses and to said adjustable means, for providing an indication of the angular displacement of said adjustment means from the north-south plane with respect to said first axis when it provides its position pulse.

3,898,745

DRYING APPARATUS FOR CONCENTRATING SOLUTIONS

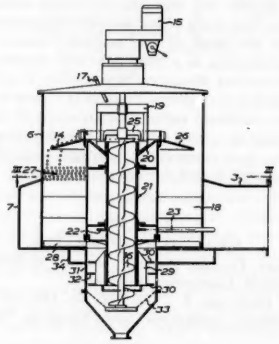
Eric Harald Carlsson, Angelholm, Sweden, assignor to Eric Harald Carlsson, Angelholm, Sweden

Filed Aug. 27, 1973, Ser. No. 391,095

Claims priority, application Sweden, Sept. 1, 1972, 11312/72

Int. Cl. F26b *3/00, 3/36*

U.S. Cl. 34—9 **9 Claims**

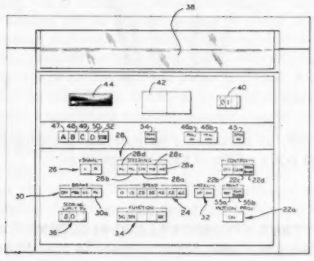


1. Apparatus for contacting a first substance, such as a liquid, semi-solid or solid material, with a second substance, such as drying gas, said apparatus comprising a container with a bed of a large number of spherical contact bodies adapted to be circulated through the container in a path which, in the order mentioned, comprises a material application zone in which the first substance is applied to the contact bodies, a main treatment zone located in the upper part of the bed, a peripheral point of introduction for the second substance, a final treatment zone located in the lower part of the bed, and a separation zone located beneath the bed for separating ready-processed material from the contact bodies, said separation zone including a perforated bottom allowing ready-processed material to pass, but retaining the contact bodies for returning them to the material application zone by means of a centrally disposed screw conveyor which includes a surrounding sleeve and extends down towards the perforated bottom, wherein the sleeve surrounding the screw of the screw conveyor is rotatable relative thereto, the material application zone having material application means rotatably disposed at the upper end of the screw conveyor and including spreading means mounted for rotation with the rotatable sleeve of the screw conveyor for spreading said contact bodies in a uniform layer on said bed; said screw conveyor being provided at its lower end with separation means comprising rotatable infeed arms secured to the rotatable sleeve of the screw conveyor for rotation therewith for feeding contact bodies from the lowermost part of said bed to a gap inside and underneath the infeed arms, said gap being formed by an inner separation rotor connected with the shaft of said screw conveyor for rotation therewith, and an outer stationary separation stator concentric with said inner separation rotor, said perforated bottom being disposed underneath said gap.

3,898,746
DRIVER TRAINER SYSTEM

Norman R. Seidle, Vestal, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Feb. 6, 1973, Ser. No. 330,001
Int. Cl. G09b *9/02*
U.S. Cl. 35—11 **9 Claims**



6. In a system for training vehicle operators wherein actual performances of vehicular functions by students on simulated controls are monitored and compared with desired performances of said vehicular functions to determine the correctness of said actual performances, the improvement comprising the combination of: percentile selection means providing a range of percentile numbers from which a selected percentile number may be chosen; vehicular function of selection means providing a plurality of vehicular functions from which a selected function may be chosen;

means for calculating the percentage of correct performances of a selected vehicular function for each of said students;

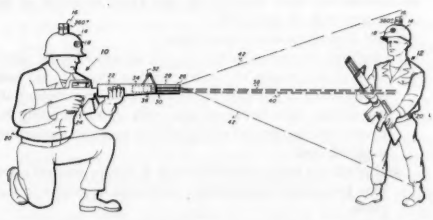
means for comparing each student's percentage of correct performances with a selected percentile number; and

means responsive to said comparing means for providing an indication of those students whose percentage of correct performances of said selected function is less than said selected percentile number.

3,898,747
LASER SYSTEM FOR WEAPON FIRE SIMULATION

Albert H. Marshall, Maitland, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 24, 1974, Ser. No. 482,544
Int. Cl. F41g *3/26*
U.S. Cl. 35—25 **9 Claims**



1. A weapon fire kill simulator system comprising:

a. laser transmitter means for producing a narrow fire beam and a wide angle kill beam,

b. laser power source means and hit detector-actuator means,

c. a weapon having a trigger switch and means for mounting all said above mentioned means integral with said weapon and in position to direct said laser means and said hit detector-actuator means in the direction in which said weapon is aimed,

d. a man target carrying equipment including apparel or patches of retroreflective material, a 360° kill beam detector-actuator means and an alarm system actuated from said kill detector-actuator means upon energization of the latter,

e. said laser means being connected for producing said fire beam when said trigger switch is closed to direct said fire beam to said target and a retroreflected fire beam from said apparel to said hit detector-actuator means,

f. said hit detector-actuator means being connected to actuate said laser means to produce said wide angle kill beam to actuate said kill detector-actuator and hence said alarm system.

3,898,748
TEACHING OR LIKE DEVICES

Robert George Flanders, 76 Tarnwood Pk. Court Rd., Eltham, London SE9, England

Filed Jan. 9, 1974, Ser. No. 431,697
Int. Cl. G09b *3/04*
U.S. Cl. 35—48 A **1 Claim**

1. A method of practicing typing and shorthand, comprising the steps of:

providing a sheet which has vertically spaced lines of shorthand characters, a blank space disposed below each of said lines and being substantially coextensive therewith, and a typed transcription of said lines of shorthand characters disposed below each of said blank spaces;

positioning said sheet in a typewriter such that a student can type in each blank space an attempted transcription of the line of shorthand characters disposed immediately above the blank space, while the transcription disposed immediately below the blank space is hidden by the typewriter; and

exposing the hidden transcription in the typewriter;

whereby an immediate check on the accuracy of the student's transcription and typing is provided.

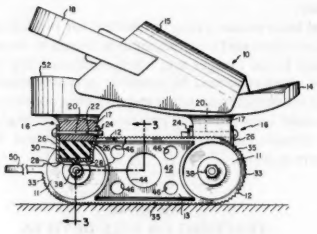
3,898,749
REMOVABLE SOLE FOR SHOE SKATE

Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.

Filed Dec. 16, 1974, Ser. No. 532,929
Int. Cl.² **A43B** *00/00;* **A63C** *3/00*
U.S. Cl. 36—2.5 R **11 Claims**

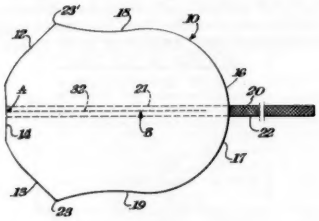
1. A removable walking sole construction for roller skates having at least one pair of tandem skate wheels, said sole contruction comprising

a. a first and second wear surface means for covering at least the bottom portions of each of said skate wheels;
b. clamping means for securely engaging each of said tandem skate wheels; and



c. substantially rigid stabilizing means interconnecting said clamping means and for cooperating therewith to prevent the rotation of said wheels.

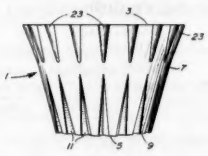
3,898,750
UNIVERSAL SIZE DISPOSABLE SHOE COVER
Louis S. Epstein, 6603 Governor Printz Blvd., Wilmington, Del. 19809
Filed Mar. 7, 1973, Ser. No. 338,916
Int. Cl. A43b *3/16, 23/00*
U.S. Cl. 36—49 **9 Claims**



1. A blank for conversion to a shoe covering which blank comprises a top section, a bottom section and two side sections, the top section comprising two portions in its foremost part which portions are joined by a substantially straight portion, each of said two portions being angularly flared to its respective side section, the bottom section comprising two portions each being rounded toward its respective side section, the terminal of each rounded bottom portion being joined to the terminal of its respective angularly flared top portion through a curve comprising one of said respective side sections which curve extends away from the center of the blank.

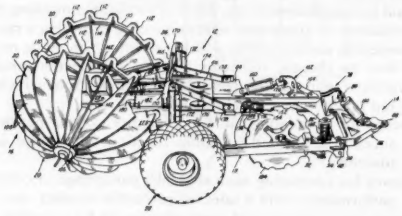
3,898,751
ATHLETIC SHOE CLEAT
Paul R. Gustin, 1766 Langport Ave., Baltimore, Md. 21222
Filed Mar. 26, 1974, Ser. No. 455,028
Int. Cl. A43c *15/00*
U.S. Cl. 36—67 D **8 Claims**

1. A cleat for a football shoe or the like comprising:
a. a base;
b. a tip;
c. a frustoconical body portion converging downwardly from said base to said tip, said body portion and said tip intersecting to form an edge;
d. a plurality of longitudinal grooves in said body portion, said grooves extending into said tip;
e. the intersection of the sides of said grooves with said body portion and said edge forming angular gripping corners on said body portion and said tip; and



f. a plurality of upstanding longitudinal gripping members on said body adjacent said base portion.

3,898,752
TREE STUMP PULLING MACHINE
Gene A. Ulve, Lake Mills, Iowa, assignor to Tree-Mate Corporation, Lake Mills, Iowa
Filed May 1, 1973, Ser. No. 356,100
Int. Cl. A01g *23/06*
U.S. Cl. 37—2 R **14 Claims**



1. In a tree stump pulling machine having a towable frame and rearwardly disposed operatively associated confronting digging wheels to engage a stump and roll it out of the ground, said frame comprising:
parallel spaced side rails having forward and rear ends,
respective cross members secured to and connecting said rails at said forward and rear ends,
a rigid plate extending between and secured to the rear end portions of said rails,
said plate being provided with a pair of spaced openings,
an upstanding rigid plate on each rail adjacent the rear end thereof,
an upstanding rigid support on the cross member at the forward ends of said rails,
a frame superstructure comprising:
a platform extending between and secured to the upper ends of said plates at the rear end portion of said rails, an elevated horizontal beam disposed on substantially the center line between said rails and extending between and secured to said platform and said upstanding support, and
said platform being provided with a pair of spaced openings to register respectively with said openings in said plate.

4. A machine for pulling tree stumps out of the ground comprising:
a towable frame having a front end and a rear end,
a pair of elongated spaced parallel collars each pivotally mounted intermediate their respective opposite ends to the rear of said frame for movement away from and to parallel positions,
a pair of elongated spaced generally parallel tubes having forward and rear ends,

means for slidably journalling the respective forward ends of said tubes in said respective collars for forward and rearward movement therein,

stop means on said collars operatively associated with said tubes to limit the forward and rearward movement of said tubes relative to said collars,

respective opposed axles on said tubes at the rear thereof each extending laterally outwardly and downwardly,

a digging wheel rotatably mounted on each axle whereby said wheels are in a confronting V shape so that their narrowest separation is towards ground level with said wheels adapted to be embraceably introduced to a tree stump so as to engage the same and roll it out of the ground as said frame is towed by a prime mover,

a laterally expandable and retractable coupling connected to and between said tubes intermediate the points of attachment of said axles thereto, and

means operable between said frame and said coupling to effect the expansion and retraction thereof whereby in expansion the forward ends of said tubes are in forward slidable position and said coupling is at its widest point of expansion to effect the widest point of separation between said tubes and said digging wheels and in retraction said tubes are moved towards their rearward slidable position with said coupling narrowing and acting to move the rear ends of said tubes and digging wheels towards each other.

3,898,753

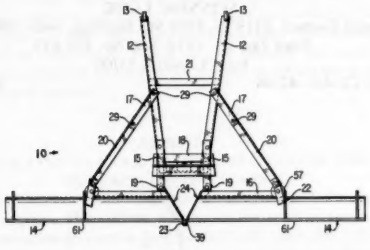
SNOW PLOW APPARATUS

Roy W. Kinnunen, 2118 E. Front St., Ashland, Wis. 54806

Filed Aug. 3, 1973, Ser. No. 385,477

Int. Cl. E01h *5/04*

U.S. Cl. 37—46 **4 Claims**



1. A snow plow having an adjustable blade which may be positioned in either a flat, fully opened position or a retracted V-position for use with a lifting device mounted on the front end of a motor vehicle, comprising:

a. a plow blade formed of two curved blade segments, the front portion of the inner end of each segment being provided with a plurality of outwardly disposed spaced annular flanges which mesh with corresponding outwardly disposed spaced annular flanges in the inner end portion of the other segment, the two blade segments being joined by a pin having a diameter slightly less than the inner diameter of the cylinder formed by the meshed annular flanges of the two blade segments, so that insertion of the pin into said cylinder results in the blade segments being interlocked in a hinged joint, the inner ends of the blade segments being angularly disposed with respect to each other from the hinged joint when the blade segments are in the flat position to form an opening of a size which is sufficient to allow the blade segments to be adjusted between the flat position and the V-position;

b. a blade housing secured to the rear surface of each blade segment;

c. a support frame including a pair of horizontal push bars, each push bar having a lug arrangement for mounting on the vehicle and with the push bar being pivotally connected to a respective horizontal bracket pivotally mounted on a brace which is secured to the inner end of one of the blade segments and the adjacent housing; and

d. means attached to the blade housing for varying the angle between blade segments;

the braces connected to the inner ends of the blade segments extending from the blade segments a distance sufficient to allow the brackets to pivot freely on the inner ends of the braces so that the brackets are substantially perpendicular to the blade segments when the plow is in the flat, fully opened position, while the brackets have their brace-connected ends displaced inwardly to lie directly behind the engaged inner ends of the blade segments when the plow is in the V-position.

3,898,754

CLOTHING DATA SYSTEM

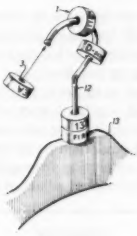
Gert Arne Johansson, Lerum, Sweden, assignor to AB Modern Modell, Lerum, Sweden

Filed Aug. 16, 1973, Ser. No. 389,071

Claims priority, application Sweden, Sept. 29, 1972, 10367/72

Int. Cl.² G09F *3/00*

U.S. Cl. 40—322 **22 Claims**



1. A device adapted to fit onto the hook of a clothes-hanger in order to convey information concerning a garment hung from the clothes-hanger, said device comprising:

a. an inner wall

i. defining a central traversing hole which is adapted to receive a clothes-hanger hook which is smaller in cross-section than the central traversing hole,

ii. being made of a resilient material, and

iii. having a radial slot therein which extends over the entire longitudinal extent of said inner wall and is of width less than the width of the clothes-hanger hook;

b. a radial wall

i. extending radially from one end of said inner wall,

ii. being made of a resilient material,

iii. being circular in shape, and

iv. having a radial slot herein which communicates with the radial slot in said inner wall and is of width less than the width of the clothes-hanger hook; and

c. an outer wall

i. depending from said radial wall on the same side thereof as said inner wall,

ii. bearing information on the external periphery thereof,

iii. being made of a resilient material,

iv. being circular in longitudinal cross-section, and

v. having a radial slot therein which communicates with the radial slot in said radial wall;

d. said inner, radial, and outer walls together defining an empty, annular volume which

i. is continuous around at least the major portion of the longitudinal cross-section of the device,

ii. is much thicker in the radial direction than said inner and outer walls, and

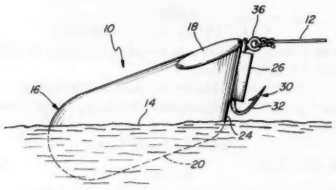
iii. is open to the exterior of the device on the side thereof opposite to said radial wall,

whereby a clothes-hanger hook having a larger cross-section than the width of the slots in said radial and inner walls may be pressed through the slots and into the central traversing hole, where it will be releasably held.

3,898,755
DUCK RETRIEVING DEVICE

George C. Halvorson, 7528 Girard Ave. South, Richfield, Minn. 55423

Filed Nov. 13, 1972, Ser. No. 305,717
Int. Cl. A01m
U.S. Cl. 43—1 **15 Claims**

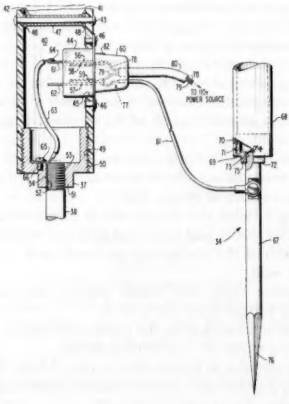


1. A duck retriever comprising an elongated buoyant body for attachment to a fish line having an upwardly sloping face at its forward end, hook means located at the forward end of said body having at least one hook end projecting forwardly from said forward end, said hook means having a relatively straight shank and said one hook end being integral with one end of said shank, means holding said shank in juxtaposition with said face so that said shank extends along said sloping face, said hook end projecting forwardly from said sloping face, and weight means located adjacent the rear of said body.

3,898,756
FISHING ROD HOLDER

Denver V. Tolle, 954 E. Locust St., Canton, Ill. 61520

Filed Sept. 5, 1974, Ser. No. 503,457
Int. Cl.[2] A01K *97/10;* **A01G** *7/04*
U.S. Cl. 43—21.2 **16 Claims**



1. A fishing rod holder comprising

an elongated non-electrically conductive tubular member open at one end and internally threaded on the other end and having an internal diameter of a size to receive the handle of a fishing rod,

the tubular member being constructed of a material which is non-chafing and sufficiently pliable to prevent damage to the handle of the fishing rod when inserted therein,

an externally threaded bushing in tightly threaded engagement with the internal threads on the end of the tubular member,

an elongated electrically conductive insertion member for inserting into soil and thereby anchoring the fishing rod holder in a desired location,

the bushing having a longitudinally extending internally threaded bore therein,

the insertion member being externally threaded on one end and the external threads thereof being in tightly threaded engagement with the internal threads in the bore of the bushing,

the said threads of the tubular member, the bushing and the insertion member being tapered pipe-type threads whereby the resultant threaded connections are rigid and vibration resistant,

the end of the insertion member remote from the said end having the threads terminating in a sharp point which facilitates inserting the same into soil,

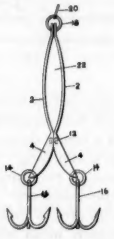
an inserter-stabilizer member rigidly mounted on the insertion member and extending outward therefrom at a location intermediate the said threads and point, the inserter-stabilizer forming approximately a 90° angle with the insertion member and being sufficiently removed from the point to allow the insertion member to be inserted into soil to a depth sufficient to anchor the fishing rod holder, and

means carried by the electrically conductive insertion member for electrically connecting the same to a source of electricity.

3,898,757
SPINNING LURE

Donald Gentert, 2419 W. Fifth St., Hastings, Nebr. 68901

Filed Jan. 25, 1974, Ser. No. 436,618
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.06 **1 Claim**

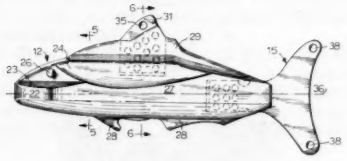


1. A fishing lure having a longitudinal center plane and comprising a pair of teaspoon-shaped objects on opposite sides of the center plane and having relatively shallow bowls and having handles each extending from one end of the bowls and curved outwardly from the center plane to provide an open space between the intermediate parts of the handles, the bowls being attached to the handles at points of attachment and being sloped outwardly from said points of attachment with respect to such center plane, means securing the bowls together at the ends adjacent the handles, back to back, the bowls having means adjacent their tips to carry hooks and the handles having means adjacent their ends remote from the bowls to receive a line.

3,898,758
FISHING LURE

Douglas Swanningson, 2611 75th St., Kenosha, Wis. 53140

Filed Apr. 17, 1974, Ser. No. 461,775
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.48 6 Claims

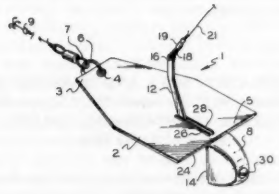


1. A lure for fish wherein the lure cooperates with other similar lures to resemble a school of fish when moved through water in the company of other lures, comprising:
   a generally oblong body portion which resembles that of a fish wherein said body portion is composed substantially of a dense material heavier than water and wherein said body portion is tapered toward fore and aft ends;
   a dorsal fin portion projecting above said body portion between said fore and aft ends, said dorsal fin portion having a connection point therein positioned at the longitudinal center of gravity of said lure, wherein said connection point provides a location at which towing force is applied;
   a pair of elongated depressions on each side of said body portion extending therealong beneath the dorsal fin to create a high pressure area for holding the lure down as the lure is towed; and
   a tail portion of resilient material extending from said aft end of said body portion and diverging away from said body portion, said tail portion cooperating with said body portion to align said body portion axially with the direction of movement of said lure by shifting the center of pressure aft of the connection point at which the towing force is applied.

3,898,759
TROLLING PLANAR RESETTABLE BELOW THE SURFACE OF THE WATER

Philip W. Jensen, Hood River, Oreg., assignor to Luhr Jensen & Sons, Inc., Hood River, Oreg.

Continuation-in-part of Ser. No. 327,731, Jan. 29, 1973, abandoned. This application May 29, 1973, Ser. No. 364,357
Int. Cl. A01k *95/00*
U.S. Cl. 43—43.13 9 Claims

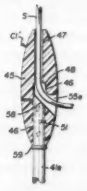


1. A trolling planer resettable below the surface of the water comprising:
   a planar plate-like planing member having a forward end and a rearward end, said member being adapted alternatively to assume a first, diving position wherein said forward end is below said rearward end and a second surfacing position when said member is parallel to an attached fishing line;
   lure attaching means mounted on said rearward end of said planing member;
   a tripping lever hingedly attached to said planing member at a point intermediate said ends for rotation with respect to said member when said member moves between said first and second positions;
   said tripping lever including an arm to which the line is attached, and a stop plate for limiting the rearward travel of said arm when moving from said second position to said first position;
   said tripping lever extending through a slot in said planing member, said arm extending above the planing member, said stop plate extending below the planing member;
   attaching means for connecting said lever to a fishing line;
   ballast means attached to said planing member forwardly of said tripping lever whereby when tension on said lever from said fishing line is relieved said ballast causes said planing member to rotate about said point to position the forward end of said member below the level of said rearward end thereby resetting said planing member from said second position to said first position,
   said ballast means being attached to the under side of said planing member and including a ballast receptacle having ballast material enclosed therein, said receptacle being positioned to engage said stop plate to limit the rearward movement of said arm.

3,898,760
HOOK CONNECTOR

Gerald B. Klein, 13451 Stuart Ct., Broomfield, Colo. 80020

Continuation-in-part of Ser. No. 128,015, March 25, 1971, Pat. No. 3,717,907, and a continuation-in-part of Ser. No. 274,307, July 24, 1972. This application Feb. 23, 1973, Ser. No. 335,081The portion of the term of this patent subsequent to Feb. 27, 1990, has been disclaimed.
Int. Cl. A01k *91/04*
U.S. Cl. 43—44.83 4 Claims



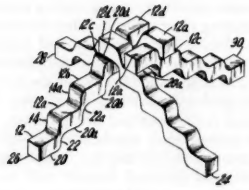
1. A hook connector for attaching a snell onto the shank of the hook, comprising:
   a body of a resilient synthetic resin material having a passageway therethrough which is sized to receive the snell; and an enlarged snell-knot socket at the end of the passageway within the body, whereinto the end of a snell extends from the passageway and is knotted to secure the same in place with the snell knot tightly fitting into the snell-knot socket;
   a socket extending into the connector which is proportioned to receive the hook shank, the bottom of said hook shank socket forming said snell-knot socket, said connector further including a side opening in the body near the bottom of said hook shank socket, said hook shank extending into its socket to a position adjacent said side opening with the end of said hook shank being angled toward said side opening to facilitate guiding a snell from the side opening which is threaded into the passageway from the end of the connector.

3,898,761

INTERLOCKING CONSTRUCTION ELEMENTS

Rami Zohar, Bat-Yam, Israel, assignor to Rami Art, Corporation, Great Neck, N.Y.

Filed Nov. 15, 1973, Ser. No. 416,071
Int. Cl.[2] A46H *33/08*
U.S. Cl. 46—25 **4 Claims**



1. Interlocking construction apparatus including at least four elongated unitary building elements arranged on support means to form a self supporting structure in which each of said building elements includes first and second longitudinal opposed serpentine sides and two longitudinal opposed substantially planar sides extending between said first and second serpentine sides, each of said serpentine sides including a plurality of substantially planar mutually parallel support surfaces and a plurality of s shaped curved surfaces extending between adjacent ones of said support surfaces and in which the first of said support surfaces of said first serpentine side of each of four of said elements rests on said support means and one of said support surfaces on said second serpentine side of a first of said elements supports one of said support surfaces on said first serpentine side of a second of said elements, one of said support surfaces on the second serpentine side of said second element supports one of the support surfaces on the first serpentine side of a third of said elements, one of said support surfaces on the second serpentine side of said third element supports one of the support surfaces on the first serpentine side of a fourth of said elements and one of the support surfaces on the second serpentine side of said fourth element supports one of the support surfaces on the first serpentine side of said first element.

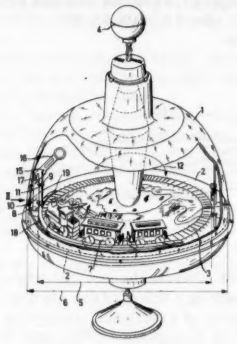
3,898,762

TOY SPINNING TOP

Peter Balleis, Hermann-Loens-Str. 55, O-8502 Zirndorf, Germany

Filed Nov. 16, 1973, Ser. No. 416,670
Claims priority, application Germany, Nov. 22, 1972, 2257195
Int. Cl.[2] A63H *7/02, 7/00*
U.S. Cl. 46—67 **9 Claims**

1. A toy spinning top comprising a transparent dome, a first disc and a second transparent disc of smaller diameter than the first disc covered by said dome, said first and second disc each having a respective marginal region, drive means to rotate said dome and said second disc about an axis and relative to said first disc, a vertically deflectable member mounted of the marginal region of said first disc and projecting into the marginal region of the second disc, cam means supported on said second disc, said cam means having a cam surface positioned to deflect the deflectable member on rotation of the second disc relative to the first disc.

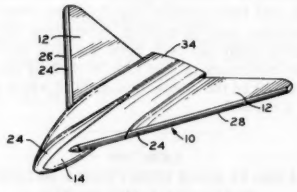


3,898,763

MODEL AIRCRAFT

Earl Rizzo, Lakewood, Ohio, assignor to Cosmo, Inc., Cleveland, Ohio

Filed July 24, 1974, Ser. No. 491,316
Int. Cl. A63h *27/00*
U.S. Cl. 46—79 **11 Claims**



1. A one piece high performance type soaring model aircraft comprising a delta wing air foil, a nose pod, and a rudder secured to the rear center portion of the underside of the wing; said wing, nose pod and rudder being formed from a unitary piece of light weight plastic material, and a dowel embedded in the nose pod extending from the front surface of the nose pod rearwardly along the longitudinal axis of the aircraft, wherein impact between the nose and a foreign object is absorbed by said dowell.

3,898,764

COMBINATION DOLL AND MARIONETTE

Richard F. Palmer, 9127 Stevenson Dr., Chicago, Ill. 60016

Filed Feb. 13, 1974, Ser. No. 430,599
Int. Cl.[2] A63H *7/00*
U.S. Cl. 46—126 **4 Claims**

1. A combination stuffed security type doll and marionette including a pair of shoulder areas, a pair of arms extending outwardly from the shoulder areas and terminating in hand portions, a torso depending downwardly from the shoulder area and a pair of legs depending downwardly from the torso region and terminating in a pair of feet, the doll comprising:

A head portion adapted to fit on the doll in position disposed immediately above said shoulder portions;

Means disposed in said torso beneath said shoulder portions and adapted to detachably engage said head portion for detachably retaining said head portion thereon;

A pair of separate chords axially moveable in a free manner and extending vertically through said torso and each having one end afixed to a respective one of said doll foot portions with the opposite end projecting through said torso and terminating in an end disposed outwardly of said torso;

Means afixed to said terminal end of each said chord adapted to be detachably attached to a manipulating chord for the operation of said associated chord extending through said doll torso;

Means affixed to said head portion at the top end thereof and adapted to be detachably attached to a manipulating chord, said means affixed to said top of said head portion and said means affixed to hand portion comprising a ring member affixed thereto adapted to be detachably attached to said manipulating chord to convert said doll to a marionette;

Means affixed to each of said hand portions and adapted to be detachably attached to associated ones of said manipulating chords;

A marionette manipulating handle member;

A plurality of manipulating chords each having one end affixed to said manipulating handle and the opposite ends thereof projecting outwardly therefrom and adapted to be attached to said associated means on said doll members for manipulation thereof, said means affixed within the torso comprising a rectangular box-like member having a front surface, a back surface, opposed side surfaces, and opposed top and bottom surfaces, a pair of horizontally spaced apart vertically extending bores extending through said block member between said top and bottom surfaces thereof with each bore adapted to receive one of said operating chords freely therethrough, and a boss member disposed centrally of said top surface and projecting outwardly therefrom and adapted to receive said head portion detachably thereon, and wherein said head portion includes a recess in the next portion thereof of a size and configuration adapted to be snugly received on said boss member for detachably attaching said head portion thereto; and

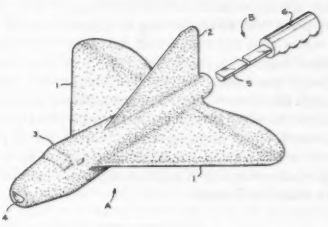
The projecting terminal ends of each of said manipulating chords having means affixed thereto adapted to be detachably attached to said means associated with said doll whereby said doll may be used as a normal regular doll and also may be readily converted for use as a marionette by attaching said manipulating chords thereto, said doll being characterized further wherein said means afixed to said head top portion and said hand portions are comprised of elastic loops afixed thereto and adapted to be detachably attached to said manipulating chords to convert the doll to a marionette said doll being further characterized wherein said means affixed to said terminal ends of each of said manipulating chords comprises an elongated rigid body member having a closed eyelet defined at one end thereof with the opposite end defining a hook member adapted to engage said means on said doll body members and said pair of chords in said doll.

3,898,765

FLYING TOY PROJECTILE

Douglas J. Lee, 1036 1/2 St., Houston, Tex. 77009

Filed July 8, 1974, Ser. No. 486,639
Int. Cl. A63h *27/14*
U.S. Cl. 46—81 **14 Claims**



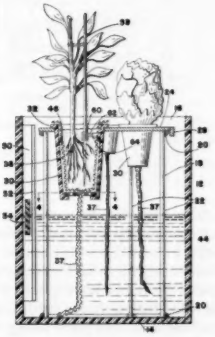
1. A system for achieving glider flight comprising a launching means comprising a rod having at least one flat surface longitudinally thereon and a projectile comprising an elongated fuselage, at least two aerodynamically stabilizing wings projecting from said fuselage and a channel extending longitudinally through said fuselage, said channel having a configuration adapted to cooperatively receive said rod therethrough and a flat surface for slidably engage said flat surface on said rod for preventing rotation of said projectile about said rod when said rod is engaged through said channel.

3,898,766

COMBINATION PLANTING DEVICE

Jacques B. Goldstaub, 547 Merritt Ave., Oakland, Calif. 94610

Filed Jan. 21, 1974, Ser. No. 434,878
Int. Cl.[2] A01G *27/00*
U.S. Cl. 47—38.1 **11 Claims**



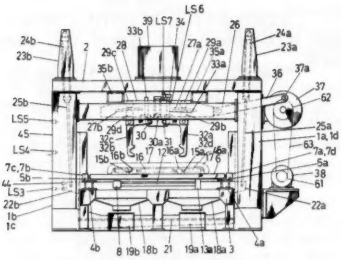
1. A decorative, self-watering planting device comprising in combination an outer water impervious container, said outer container having a bottom, side walls and an open top, an upstanding support frame removably positioned within said outer container, said support frame being generally open in construction and spaced inwardly from the sides of said outer container, a substantially planar removable grid supported on an upper surface of said frame in inwardly spaced relation from the side wall of said outer container, said grid being provided with a plurality of apertures of desired configuration and placement, a plurality of inner plant containers removably

positioned and supported within the apertures of said grid, said plant containers being provided with support means at an upper peripheral portion whereby the plant containers extend downward within said open frame and said other container, each of said inner plant containers being provided with a removable apertured bottom member, said bottom member providing means to support an inner liner constructed at least in part of fibrous elements capable of transmitting liquid by capillary action, the liner for each of said inner plant containers having a portion extending downward through the apertured bottom member into a lower region of said outer container, the removable bottom member and liner of each of said inner plant containers serving to support a plant and its planting soil within the same, and means to introduce water and nutrient liquids to the lower region of said outer container whereby the same can be transmitted by capillary action through the downward extending portions of said liners which function as wick means for each individual plant container, said combination planting device thereby serving as a self-contained, self-watering combination adapted to continuing life support of a plurality of individual plants contained within said inner plant containers.

3,898,767
AUTOMATIC RECIPRO-FINISHING MACHINE

Hisamine Kobayashi, Nagoya, Japan, assignor to Shikishima Tipton Mfg. Co., Ltd., Nagoya, Japan

Filed Jan. 15, 1974, Ser. No. 433,491
Claims priority, application Japan, Jan. 19, 1973, 48-8376
Int. Cl. B24b *51/00, 31/00*
U.S. Cl. 51—7 **5 Claims**

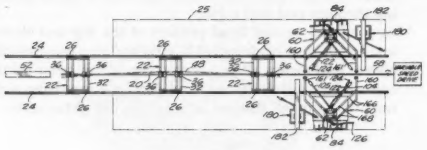


1. An automatic recipro-finishing machine, comprising:
traverse guides operatively mounted on said machine;
a trough adapted to be filled with abrasive media;
means operatively coupled to said traverse guides for finishing a workpiece by reciprocating said workpiece in said trough while filled with abrasive media, said means reciprocatively moving said workpiece along a path defined by the shape of said traverse guides;
means operatively mounted for conveying workpieces to and from said finishing means;
means operatively mounted for chucking said workpiece over said finishing means;
means operatively coupled to said finishing means for stopping said workpiece at a given position after the finishing operation has been completed; and
means operatively coupled to said finishing means, said conveying means, said chucking means, and said stopping means for controlling the operations thereof in a predetermined sequence.

3,898,768
SANDBLASTING APPARATUS

Neal J. Gilbert, Highland, and Edward L. Horton, El Monte, both of Calif., assignors to Enviro-Blast International, Los Angeles, Calif.

Filed May 13, 1974, Ser. No. 469,214
Int. Cl. B24c *3/12*
U.S. Cl. 51—15 **28 Claims**

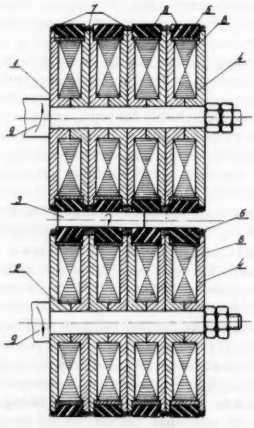


1. In an apparatus for sandblasting surface areas of elongate structural members having different configurations, the combination of:
means to move the members longitudinally along a path through a sandblasting zone;
at least one horizontal blaster unit in said zone with laterally directed nozzle means movable in an upright orbit to sandblast the surface area of a member of one configuration;
at least one overhead vertical blaster unit in said zone with downwardly directed nozzle means movable in a substantially horizontal orbit to sandblast the surface area of a member of another configuration; and
means respectively supporting said blaster units for independent movement laterally of said path between a position of non-use and an operating position of use,
whereby the horizontal blaster unit and the vertical blaster unit may be selectively utilized to sandblast the surface areas of members having different configurations.

3,898,769
METHOD AND APPARATUS FOR CENTRELESS MAGNETIC ABRASIVE POLISHING

Boris Georgiev Makedonski; Atanas Dimitrov Kochemidov; Ivan Minkov Dumanov, and Stefan Georgiev Payakov, all of Sofia, Bulgaria, assignors to Zniitmash, Sofia, Bulgaria

Filed Apr. 16, 1974, Ser. No. 461,440
Int. Cl.[2] B24B *5/22;* **B24D** *3/00, 17/00*
U.S. Cl. 51—88 **6 Claims**



1. An apparatus for the centreless polishing of a workpiece said apparatus comprising two cylindrical roll means and a

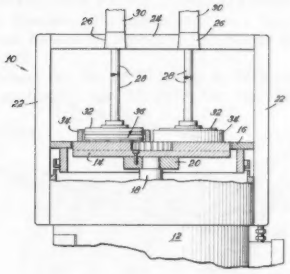
guide means for supporting said workpiece wherein said roll means are positioned with respect to each other such that their axes are not parallel and the axis of said workpiece is above the plane formed by the axes of said roll means, and wherein at least one of said roll means comprises at least one electromagnetic means, at least two guide rings with a working gap therebetween and a ferromagnetic powder in said working gap said ferromagnetic powder being held therein by said electromagnetic means.

3,898,770

LAPPING FIXTURE REFERENCE PLATE ASSEMBLY

Ernest A. Benz, and James V. Keefe, both of Park Ridge, Ill., assignors to Speedfam Corporation, Des Plaines, Ill.

Filed Nov. 25, 1974, Ser. No. 526,612
Int. Cl.[2] B24B *5/00, 29/00*
U.S. Cl. 51—129 **4 Claims**



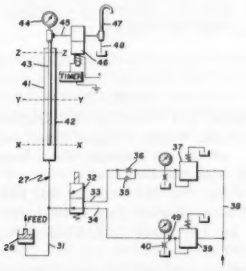
1. For use in lap limiting fixture means, a reference plate assembly comprising a horizontal reference plate having an upper surface, a lower workpiece engaging surface, and three circumferentially spaced apart vertical apertures open at their upper ends; and insert units vertically adjustably mounted in said apertures with the plane of the upper ends of said insert units lying below the plane of said upper surface and parallel to the plane of said lower workpiece engaging surface.

3,898,771

GRINDING MACHINE

Martin L. Kuniholm, Worcester, Mass., assignor to Cincinnati Milacron-Heald Corporation, Worcester, Mass.

Filed Nov. 19, 1973, Ser. No. 416,980
Int. Cl. B24b *49/08*
U.S. Cl. 51—165.9 **6 Claims**



1. A grinding machine, comprising:

a. a base,

b. a workhead table mounted on the base and adapted to carry a workpiece,

c. a wheelhead table mounted on the base and adapted to carry a wheelhead in which is mounted a spindle carrying an abrasive wheel,

d. a controlled-force feed mechanism connecting the base to one of the tables to produce relative movement between the tables to cause engagement of the abrasive wheel and the workpiece for a grinding operation, the feed mechanism including an actuator,

e. a selector valve connected by a conduit to the actuator,

f. a source of low-pressure fluid connected to the valve,

g. a source of high-pressure fluid connected to the valve, the selector valve being operative to connect either source to the conduit and to the actuator, and

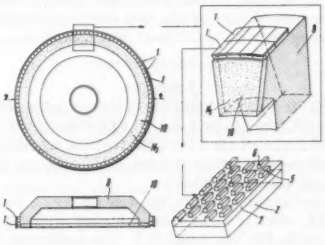
h. an air trap communicating with the conduit to retard the build-up of fluid pressure in the actuator when the selector valve connects the source of high-pressure fluid to the actuator, the air trap consisting of a vertical primary tube closed at the ends, a conduit leading from the bottom of the tube to the actuator, and a secondary tube entering the top of the primary tube and extending coaxially from the top end to a position spaced from the bottom, the secondary tube extending from the top of the primary tube, being connected to one side of a solenoid valve which opens when the grinding machine is stopped, and the other side of the solenoid valve being connected to a fitting which has an upwardly-extending branch leading to the atmosphere and a downwardly-extending branch leading to oil storage.

3,898,772

MATERIAL REMOVAL TOOL WITH MULTIPLE CUTTING EDGES

Wlodzimierz Sawluk, Hamburg, Germany, assignor to Ernst Winter & Sohn, Hamburg, Germany

Filed Aug. 3, 1973, Ser. No. 385,478
Claims priority, application Germany, Aug. 4, 1972, 2238387
Int. Cl.[2] B24D *5/02, 7/02*
U.S. Cl. 51—206 P **17 Claims**



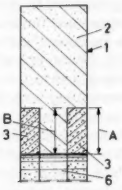
1. In a material removing tool, a combination comprising a base member having an outer surface; and a plurality of cutting elements projecting from said outer surface, each of said cutting elements comprising a plate-shaped portion having a first surface and a plurality of substantially equal projections projecting substantially uniformly spaced from each other from said first surface and each having at least one cutting edge substantially parallel to and spaced from said one cutting edge on the other projections, said plate-shaped portion and said projections thereon being integrally formed from a homogeneous mass of crystalline hard particles of at least one material chosen from the group consisting of crystalline diamond particles and crystalline boron nitride particles, and a connecting member of cemented carbide integral with the surface of said plate-shaped portion opposite said first surface of each cutting element and connecting said cutting elements to said outer surface of said base member uniformly distributed on said outer surface with said at least one cutting edge on all projections extending substantially parallel to each other.

3,898,773

GRINDING DISK

Erich Bogusch, Schwaz, Austria, assignor to Tyrolit-Schleifmittelwerke Swarovski K.G., Schwaz, Austria

Filed Aug. 28, 1973, Ser. No. 392,328
Int. Cl.[2] B24D *5/04, 5/14*
U.S. Cl. 51—206 NF **4 Claims**



1. In a grinding disk for high-speed grinding and having an axial borehole therethrough and having a primary grinding layer formed of a grinding material of a desired grinding strength, the improvement comprising:

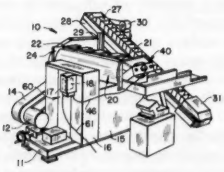
a ring-shaped zone of increased strength material adjoining said borehole of the grinding disk, said zone of increased strength material comprising at least one disk-shaped element extending radially from said borehole no more than two-thirds of the radius of said disk, each said at least one disk-shaped element having a pair of parallel surfaces formed by planes extending radially outwardly from said borehole and a cylindrical surface joining said pair of parallel surfaces, the axial thickness of said disk-shaped element being less than the axial thickness of said disk, said grinding material and said material of increased strength overlapping one another in the radial direction of said disk within said zone by a radial distance equal to at least a major portion of the radial length of said zone, contact between said grinding material and said at least one disk-shaped element in said zone being only at said cylindrical surface and at least one of said parallel surfaces, and said increased strength material having the same type of bond as the said grinding material of said grinding layer but a different filler therefrom.

3,898,774

CONTINUOUS FEED VIBRATORY FINISHING METHOD WITH DISCHARGE RATE CONTROLLED BY OPERATION OF TUB DISCHARGE CLOSURE

John F. Rampe, Mayfield Heights, Ohio, assignor to Rampe Research, Cleveland, Ohio

Division of Ser. No. 270,700, July 11, 1972, Pat. No. 3,831,322, which is a continuation-in-part of Ser. No. 8,815, Feb. 5, 1970, Pat. No. 3,685,213. This application Feb. 14, 1974, Ser. No. 442,442
Int. Cl. B24b *1/00*
U.S. Cl. 51—313 **7 Claims**



1. A continuous feed process for finishing workpieces in the tub of a vibratory finishing having a closure for selectively opening and closing a tub discharge opening, comprising the steps of:

a. feeding workpieces and media into the tub at a location spaced from the discharge opening;

b. vibrating the tub to impart a motion to the workpieces and media to preform a finishing operation on the workpieces and to move the workpieces and media from said location toward the discharge opening; and,

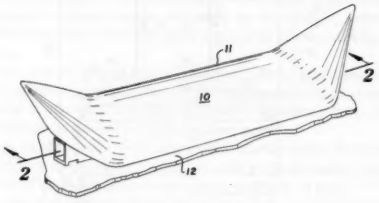
c. repetitively cyclically opening and closing the closure during the period while each workpiece is retained in the tub to control the rate at which workpieces and media discharge through the opening to control the retention time of workpieces within the tub.

3,898,775

INFLATABLE ARENA STRUCTURE

William B. Webb, 600 Simonet Dr., Elk River, Minn. 55330

Filed Aug. 20, 1973, Ser. No. 390,092
Int. Cl.[2] E04B *1/34*
U.S. Cl. 52—2 **5 Claims**



1. In an air pressure supported structure comprising an envelope of generally flexible sheet material adapted to be maintained in erected disposition by positive fluid pressure provided within the envelope:

a. said sheet material forming the envelope being in the form of a rectangular member with a central axis, a transverse axis and first lateral edge surfaces parallel to said transverse axis, and second lateral edge surfaces parallel to said central axis, and being folded upon itself generally along the said central axis to form a member with a generally rectangular configuration and with the superimposed portions of said first lateral edge surfaces of said rectangular member being secured together to form the envelope;

b. support means arranged to mount the second lateral edge surfaces of said envelope on a generally rectangular support plane so as to provide, upon inflation, an erected envelope with end extensions diverging upwardly and outwardly from said support plane.

3,898,776

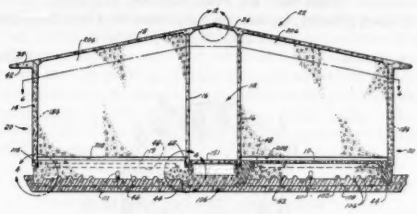
PRECAST CONCRETE HOUSING

Elmer Adrian Cox; Wayne Douglas Tiner, and Ritchey Paul Woods, Jr., all of San Antonio, Tex., assignors to H. B. Zachary Co., San Antonio, Tex.

Division of Ser. No. 191,505, Oct. 21, 1971, Pat. No. 3,772,835. This application July 2, 1973, Ser. No. 375,844
Int. Cl.[2] E04B *7/02;* **E02D** *27/42*
U.S. Cl. 52—79 **16 Claims**

1. A precast concrete building unit comprising a floor slab, several precast concrete structural panels above the floor slab, said structural panels comprising at least two load-bearing exterior walls joined with the floor slab, a roof cast integrally with the exterior walls, and an interior wall having an end which is cast integrally with at least one of the exterior walls

and a top which is cast integrally with the roof, the interior wall having an undersurface spaced from the upper surface of



the floor slab so that the interior wall does not transmit a load to the floor slab.

3,898,777

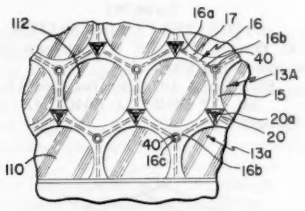
DOME AND VAULT CONSTRUCTION

Tancho D. Georgiev, 78 Hawthorne Ave., Newton, Mass. 01915, and Robert M. Scanzani, 182 Bridge St., Beverly, Mass. 01020

Continuation of Ser. No. 35,777, May 8, 1970, abandoned. This application Apr. 23, 1973, Ser. No. 353,417

Int. Cl. E04b *1/32, 7/08*

U.S. Cl. 52—81 **15 Claims**



1. A curved building formed from

A. a plurality of building elements, each

1. having an inner frame of at least three interconnected generally coplanar rods

a. joined to each other at a common center;

b. extending from said common center at obtuse angles to each other;

c. having fastening means on the outermost ends of at least two of said rods;

2. having an outer skin

a. formed about, and enclosing, at least portions of each of said rods and defining legs along said portions;

b. said portions having inner and outer faces forming inner and outer shell surfaces of said building structure;

c. said portions having end faces generally transverse to said inner and outer faces and forming load-transmitting surfaces for loads applied to said elements;

d. the fastening means on said rods projecting through the end faces on said skin; and

B. a plurality of connectors, each

1. comprising a face plate having at least three face portions, each face portion mating with a corresponding end face of a separate building element in load-transferring relation thereto;

2. an inner hub having a plurality of rods extending radially therefrom, each rod having a fastening element thereon;

3. web means interconnecting the inner hub to the face plate; and

4. apertures in said face plate through which the outermost ends of the rods of the structural elements to be attached thereto extend, whereby the fastening means of said rods are connected to the corresponding fastening elements of said connector means.

3,898,778

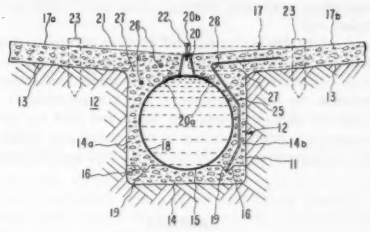
SLOTTED DRAINAGE CONDUIT AND INTEGRAL CONCRETE FLOOR

Lennart G. Erickson, 2075 Pioneer Ct., San Mateo, Calif. 94402, and William S. Erickson, 260 Casitas Bulevar, Los Gatos, Calif. 95030

Filed Jan. 10, 1974, Ser. No. 433,017

Int. Cl.² E02B *11/00;* **E04B** *1/345*

U.S. Cl. 52—169 **24 Claims**



1. A method of forming a slotted drainage conduit comprising: forming a trench in the ground; laying a concrete base in the bottom of the trench; placing an inflatable tube on said base; inflating the tube; the transverse dimension of the tube when inflated being less than the width of the trench; holding the tube against substantial lateral movement on the base when the tube is inflated; pouring concrete in the trench onto the base and about and along the tube when the latter is inflated and held on said base; maintaining a region extending upwardly from the tube free of concrete as concrete is poured about the tube; allowing the concrete about the tube to set to a hardened condition to thereby form a conduit having a slot through said region; and deflating the tube and removing the same from the conduit.

3,898,779

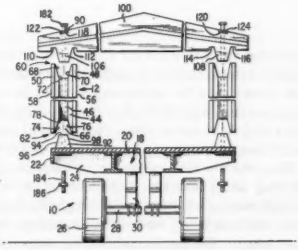
MODULAR BUILDING PANELS AND ENCLOSURES

Charles W. Tracy, Tallahassee, Fla., assignor to Apollo Plastics, Inc., Fla.

Continuation-in-part of Ser. No. 407,012, Oct. 16, 1973. This application July 24, 1974, Ser. No. 491,580

Int. Cl.² E04B *7/02;* **E04C** *3/10*

U.S. Cl. 52—264 **61 Claims**



1. A building structure including foundation means supporting a plurality of load-bearing wall panels assembled in side-by-side relationship, each said panel extending the full height of a wall of said structure, and each panel including:

a core of foamed, high density organic resinous material formed as a generally rectangular panel having spaced major surfaces;

a surface layer bonded to at least one of said major surfaces to provide a finished wall surface;

interlock means on each side edge of said panel for aligning and interlocking said panel with adjacent panels upon assembly of said structure;

top channel means formed in and extending across the top edge of said panel, said top channel means being narrower than the thickness of said panel and having a trapezoidal cross section;

a top beam having a trapezoidal cross section corresponding to the cross sectional shape of said top channel means;

tension means secured at one end to said foundation and extending vertically through said panel and said top beam; and

means adjustably securing said tension means to said top beam to draw said top beam down into said top channel means to place said panel in compression and fasten it in position on said foundation, the complementary cross sectional shapes of said top beam and said top channel means preventing splitting of said panel and distributing the compressive load produced by said tension means.

3,898,780

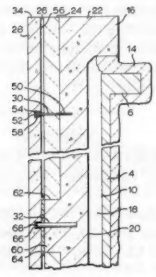
RAINSCREEN WALL PANEL

Fred Albert Beer, Toronto, Canada, assignor to Beer Precast Concrete Limited, Scarborough, Canada

Filed Oct. 5, 1973, Ser. No. 403,806

Int. Cl.[2] E04B *1/74, 2/22*

U.S. Cl. 52—303 **2 Claims**



1. A prefabricated rainscreen wall panel comprising a precast reinforced concrete slab capable of withstanding forces to which the panel may be subjected, a rigid layer of thermal insulation over the outer surface of the concrete slab and fixed thereto, a rigid, decorative outer facing sheet extending over the layer of insulation, spaced apart anchors fixing the facing sheet to the concrete slab, a gap for circulation of air separating the facing sheet and the insulation layer, the reinforced concrete slab having a projection through the insulation layer, one of said anchors being embedded in said projection and in the facing sheet, the projection being separated from the facing sheet by a resilient pad, and a passageway through which the gap communicates with the atmosphere, the panel being in the form of a transportable unit and having means on the rear surface of the slab whereby the panel can be attached on a building structure.

3,898,781

TRANSPARENT PAVING TILE STRUCTURE

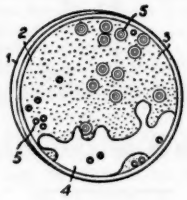
Bruno Facchini, Viale Pasubio 3, Milan, Italy

Filed Nov. 17, 1969, Ser. No. 877,412

Claims priority, application Italy, Nov. 26, 1968, 24190/68

Int. Cl. G09f *3/00, 13/34*

U.S. Cl. 52—311 **1 Claim**



1. A paving tile having two parallel spaced apart walls joined at their edges to define a closed interspace therebetween, a viscous liquid partially filling said interspace and containing air bubbles therein, said walls being made of transparent resilient material there by to allow, upon treading, deformation thereof causing a random movement of said bubbles.

3,898,782

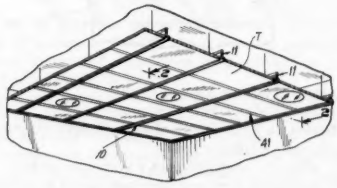
INTEGRATED CEILING SYSTEM

Anthony C. Donato, Westfield, N.J., assignor to Lightolier Incorporated, Jersey City, N.J.

Filed Jan. 4, 1974, Ser. No. 430,913

Int. Cl.[2] E04B *5/52;* **E04C** *2/42*

U.S. Cl. 52—488 **3 Claims**



1. An electrified hung ceiling grid construction comprising, in combination, a plurality of horizontally disposed parallel runner members supported in coplanar alignment from a building structure, said runner members including a vertically directed mounting web and horizontally disposed tile support flanges, upper and lower spaced locking flanges in proximate spaced relation to and disposed on either side of said mounting web, said locking flanges and web defining vertically directed locking channels, a plurality of longitudinally spaced, transversely extending locator apertures formed in said mounting webs, cross strut means extending between adjacent runners and locking the same against relative transverse movement, said strut means including at their ends projecting tab members adapted to be inserted through said locator apertures, and adjacent the ends of said struts locking clip members including resilient locking means projecting beyond the upper and lower surfaces of said struts, said locking means being insertible into the space between said locking flanges and being extended into tightly wedged position within said locking channels responsive to rotation of said struts about their longitudinal axes, a plurality of tile support hangers extending between adjacent parallel runners, said support hangers including horizontally extending tile support ledges disposed in coplanar alignment with the tile support flanges of said runners, a plurality of alignment slots formed in said mounting webs of said runners, said slots being regularly

spaced apart in accordance with the desired spacing of said hangers, complemental connector means on said hangers extending through said alignment slots and linking the distal ends of adjacent support hangers, said connector means including a finger on one said hanger slidably engaging a finger socket on the other said hanger, thus to permit relative horizontal movement between said adjacent hangers, the spacing between the clip members at opposite ends of said struts being coordinated with the length of said support hangers whereby, upon rotation of said struts into locking position, the ends of said ledges of said struts are tightly abutted against said flanges of said runners.

3,898,783

BUILDING PANEL AND JOINT

Robert B. Matlock, Houston; Reginald B. Wilmer, Cypress, and Dale L. Ferguson, Houston, all of Tex., assignors to National Steel Products Company, Houston, Tex.

Filed Feb. 4, 1974, Ser. No. 439,408
Int. Cl.[2] E04D *3/362*
U.S. Cl. 52—529 **1 Claim**

1. A building panel having complementary joint-forming marginal edge portions,

A. the first of said edge portions having

1. a first shelf part substantially parallel to the plane of the panel,

2. a first flange extending outwardly from the outer edge of said shelf part and forming a pivotal corner therewith, and

3. a male terminal loop on said first flange,

B. said complementary edge portion having

1. inner and outer shelf parts and

2. a connecting part forming a "U" with legs substantially parallel to the plane of the panel,

3. a second flange extending outwardly at substantially 90° from the reentrant edge of said outer shelf part, and

4. a female terminal loop on said second flange overlying said outer shelf part,

C. said male terminal loop being of a width sufficient to snugly fit within the female terminal loop of an adjacent similar panel, and

D. there being sufficient space between the extremity of said complementary female loop and said outer shelf part to receive said male terminal loop therebetween for engaging said second flange when said adjacent panel is moved edgewise toward siad first panel,

E. said first flange and said outer shelf part being of sufficient length to cause said outer shelf part to engage and slid on said pivotal corner during initial rotation of said adjacent panel about said male loop and thereby enforce snug interfitting of said male loop into said female loop during continued rotation of said adjacent panel to its fully assembled position and to undergird said first shelf part in said latter position to resist shear forces.

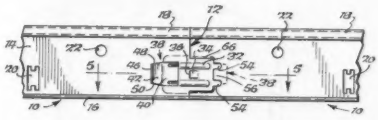
3,898,784

BEAM SPLICE CONNECTION

Gale E. Sauer, and Conrad Christel, both of Williamsville, N.Y., assignors to Roblin Hope's Industries, Inc., Buffalo, N.Y.

Filed Feb. 20, 1973, Ser. No. 334,049
Int. Cl.[2] F16B *7/22*
U.S. Cl. 52—758 A **11 Claims**

1. A splice connection comprising: at least two coaxially aligned beam members each having a web, connecting means on adjacent ends of said webs splicing said members in an end-to-end relation, said connecting means comprising a tongue extending beyond the end of each of said webs in a plane laterally offset from its respective web and parallel thereto, a tab extending axially outwardly from each of said tongues and laterally from the plane of said tongue in the general direction of said web, each of said webs having an opening provided therein axially spaced from said ends through which the tab of the other tongue is axially received said openings having a verticle dimension which is substantially equal to the maximum vertical dimension of said tabs,



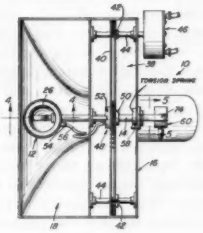
and a finger formed integrally in each of said webs and extending axially toward said adjacent beam end into each respective said opening in bearing engagement against said received tongue of the other web each of said beam members being provided with longitudial flange means extending laterally from its respective web and terminating in an end abutting the end of the flange means of the other member to prevent axial movement of said members toward each other, and means interlocking said tongues together in an assembled relation preventing relative movement of said members away from one another.

3,898,785

VACUUM OPERATED FRUIT PICKER

Clarence W. Chew, 8139 Broughton St., Sarasota, Fla. 33580

Filed Jan. 25, 1974, Ser. No. 436,682
Int. Cl.[2] A01D *46/24*
U.S. Cl. 56—332 **6 Claims**



1. A vacuum operated citrus picker, comprising, in combination:

a. vacuum means for engaging a selected article and holding same firmly in place; and

b. clutch means for selectively rotating the vacuum means and severing an engaged article from a support associated therewith, the vacuum means including valve means for placing a vacuum on an article on contact of the article with the valve means, the vacuum means further including a cup-shaped housing provided with a void and an opening communicating with the void, the opening arranged for receiving at least a portion of an article, a seal arranged around the opening, and a conduit mounted on a wall of the housing and arranged communicating with the void for selectively creating a vacuum therein, with the valve means being a flapper valve arranged in the void for being contacted by an article received in the opening

and extending into the void, and pivotally mounted on the conduit and arranged for normally blocking the conduit and being pivoted to a position unblocking the conduit when contacted by an article.

3,898,786

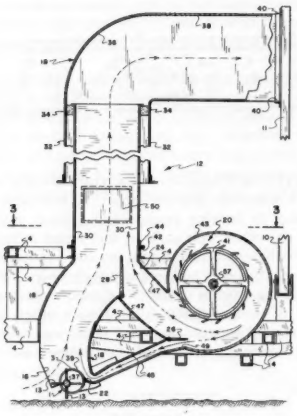
AIR DELIVERY FOLIAGE WAGON

Ezra Cordell Lundahl, Providence, Utah, assignor to Ezra C. Lundahl, Inc., Logan, Utah

Filed Jan. 24, 1974, Ser. No. 436,286

Int. Cl.[2] H01D *87/00*

U.S. Cl. 56—344 **19 Claims**



1. A wagon for receiving loose foliage to create a stack therefrom comprising:

a receptacle movable along the ground in a field upon ground-engaging means;

a mechanism carried at the front end of the receptacle for picking up foliage from the ground, and elevating and depositing the picked up foliage in the receptacle, the mechanism comprising:

a chute, unobstructed by any mechanical foliage lifting mechanism, comprising an elevated discharge section from which foliage is discharged into the receptacle, a central vertically directed portion and a foliage influent end immediately above the ground, at which end foliage is lifted from the ground into the chute;

blower means, adjacent but offset from the influent end of the chute, by which air under pressure is obtained; first air discharge means operable to communicate air under pressure from the blower means to a first location at the foliage influent end juxtaposed the ground; second air discharge means operable to communicate air under pressure from the blower means to another chute location substantially above the first location;

means selectively controlling the magnitude of respective air flow from the first discharge means and the second discharge means.

3,898,787

HOUSING FOR OPEN-END SPINNING TURBINE

Rolf Wehling, and Rolf Neubert, both of Bremen, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

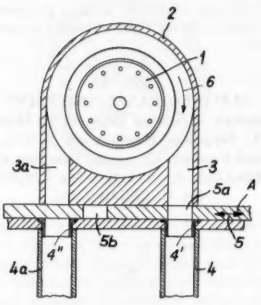
Filed May 9, 1973, Ser. No. 358,804

Claims priority, application Germany, May 12, 1972, 2223068

Int. Cl. D01h *7/00*

U.S. Cl. 57—58.89 **8 Claims**

1. A housing for an open-end spinning rotor rotatable in clockwise and counterclockwise directions and operable at subatmospheric pressure, which includes in combination, chamber means for receiving a spinning rotor, two conduits respectively connectable to a suction device, said conduits being tangentially oriented with respect to said rotor, one of said conduits defining a suction outlet for tangential air withdrawal in the clockwise direction of rotor rotation and the



other of said conduits defining a suction outlet for tangential air withdrawal in the counterclockwise direction of rotor rotation, and control means associated with said conduits and operable selectively to close off either one of said conduits while simultaneously leaving the respective other one of said conduits open for connection to said suction device.

3,898,788

PROCESS OF SPINNING TEXTILE FIBERS

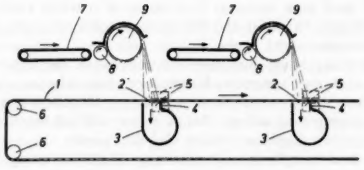
Ernst Fehrer, Auf der Gugl 28, Linz, Austria

Filed Jan. 7, 1974, Ser. No. 431,041

Claims priority, application Austria, Jan. 17, 1973, 346/73; Oct. 5, 1973, 8501/73

Int. Cl. D01h *1/12*

U.S. Cl. 57—156 **1 Claim**



1. A process of spinning textile fibers which comprises:

a. continuously moving a carrier having two opposite faces and permeable to flow of air between said two faces in a predetermined direction sequentially through a first zone and a second zone separated from said first zone by a boundary transverse to said direction;

b. applying suction to one of said faces in said first zone while maintaining equal pressure on said two faces in said second zone, whereby ambient air is caused to flow through said carrier inward of the other face thereof in said first zone, no air flows through said carrier in said second zone, and a current of air is caused to flow in a direction opposite to said predetermined direction from said second zone toward said first zone;

c. depositing textile fibers on said other face before said carrier passes said boundary from said first zone to said

second zone, whereby said fibers are held to said other face by said air flowing in said first zone, are released from said other face in said second zone, and are twisted between said moving carrier and said current; and

d. withdrawing said twisted fibers from said carrier transversely to the direction of carrier movement adjacent said boundary.

3,898,789

ELECTRIC CLOCK

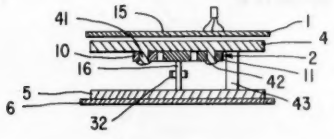
Friedrich Arzi; Paul Hofert, and Roland Sudler, all of Frankfurt, Germany, assignors to VDO Adolf Schindling AG, Frankfurt, Germany

Filed Feb. 22, 1974, Ser. No. 445,290

Claims priority, application Germany, Mar. 8, 1973, 2311445; Aug. 23, 1973, 2342544

Int. Cl. G04c *3/00*

U.S. Cl. 58—23 R **7 Claims**



1. In an electric clock including a plurality of wheels on spindles, a hand mechanism whose elements are arranged between two plastic plates, an electronic unit for generating a pulse train of constant frequency, and a single phase stepping motor with a permanent-magnet armature responsive to the pulse train, the motor comprising an armature shaft, a stator with a field coil, and a permanent magnet armature, the improvement comprising:

A. a field coil on a coil spool,

B. the stator comprising at least two parts joined to the coil spool, each of said parts being provided with at least one fastening element,

C. bearings molded in the two plastic plates for the wheel spindles and armature shaft,

D. a recess in at least one of the two plastic plates for the field coil on its spool,

E. a plurality of correspondingly positioned fastening elements in at least one plate corresponding to the fastening elements in the stator parts, including fastening means for connecting the corresponding fastening elements,

F. spacer means molded into at least one plate to support the other plate,

G. a dial face secured to a front one of the two plastic plates,

H. a printed circuit plate bearing the electronic unit, and

I. range spacer means molded to a rear one of the two plastic plates for fastening the printed circuit plate on a side of the rear one of the two plastic plates away from the front one of the two plastic plates and in a spaced relationship with the rear one of the two plates.

3,898,790

BATTERY-DRIVEN WATCH WITH BATTERY CONSUMPTION DISPLAY ALARM

Hirotoki Takamune, and Fujio Ishida, both of Tokyo, Japan, assignors to Citizen Watch Company, Limited, Tokyo, Japan

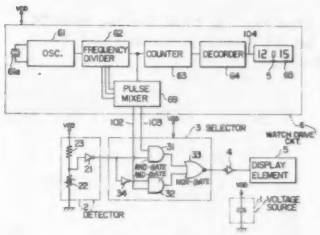
Filed Nov. 8, 1973, Ser. No. 413,951

Claims priority, application Japan, Nov. 9, 1972, 47-112465; Nov. 20, 1972, 47-116312

Int. Cl.[2] **G04C** *3/00;* **G04B** *19/30;* **G08B** *21/00*

U.S. Cl. 58—23 BA **6 Claims**

1. In a battery driven electronic watch comprising a watch driver circuit, a battery for feeding current thereto, and a time-indicator operatively connected with said driver circuit, the improvement comprising a binary detector circuit connected to said battery for detecting when the source voltage falls below a predetermined level, a selector and drive circuit connected with the output of said detector, and an electrically illuminatable means connected with said selector and drive circuit, the brightness of said illuminatable means being modified from its normal state when said source voltage drops below said predetermined level in response to the binary logic output of said detector, said electrically illuminatable means being mounted on the front and normally visible surface of said watch.



3,898,791

ELECTRICALLY DRIVEN TIMERS

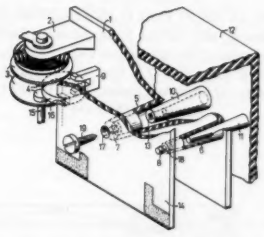
Robert Wolber, Lauterbach, Germany, assignor to Gebruder Junghans GmbH, Schramberg, Wurtt, Germany

Filed June 25, 1974, Ser. No. 483,036

Claims priority, application Germany, June 30, 1973, 7324375

Int. Cl. G04b *45/00*

U.S. Cl. 58—28 A **13 Claims**



1. A subassembly for electrically powered timer mechanisms, said subassembly comprising:

housing means;

mounting plate means;

timer means mounted to said mounting plate means including magnet means;

conductor plate means;

connecting means for connecting said housing means, mounting plate means, and conductor plate means together;

coil means mounted to said conductor plate means;

said connecting means including at least two supporting means for mounting said conductor plate means to said mounting plate means;

at least one of said supporting means receiving securing means for fixedly securing said conductor plate means to said mounting plate means; and

alignment means carried by said mounting plate means in predetermined position relative to said magnet means for

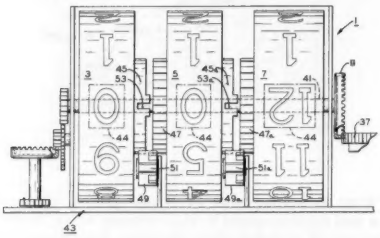
aligning said coil means in proper orientation relative to said magnet means when said conductor plate means is mounted to said mounting plate means.

3,898,792

DIGITAL TIMER

Gene L. Insley, Rock Falls, and Merle J. Lewis, Morrison, both of Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed Apr. 25, 1974, Ser. No. 464,255
Int. Cl. G04f *3/06*; **G04b** *27/00*, *19/02*
U.S. Cl. 58—39.5 **21 Claims**



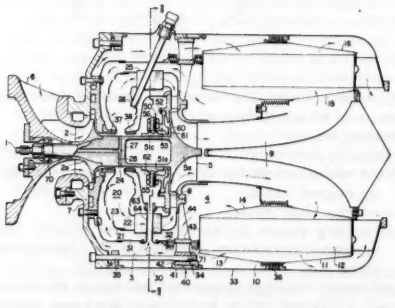
1. A digital timer comprising means operable generally for indicating digital time and adapted to be reset to a selected time, means for controlling operation of the indicating means, means for driving the controlling means to effect the time indicating operation of the indicating means, means idly driven through the controlling means by the driving means and operable manually for actuating the controlling means to effect the reset of the indicating means to the selected digital time, and the controlling means including means for releasing the drive of the driving means upon the manual operation of the actuating means.

3,898,793

BEARING SYSTEM FOR GAS TURBINE ENGINE

Kenya Nakamura, and Akira Sato, Susono, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Aug. 8, 1973, Ser. No. 386,493
Claims priority, application Japan, Aug. 17, 1972, 47-81794
Int. Cl. F02c *7/06*
U.S. Cl. 60—39.08 **8 Claims**



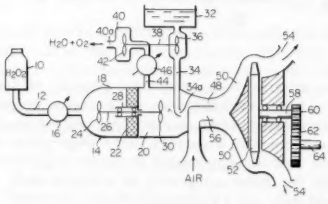
1. In a bearing system for supporting the main shaft of a gas turbine engine, said engine including a compressor for delivering air to said engine, a turbine for rotatively propelling said main shaft, and a combustion chamber producing hot gases for delivery to said turbine, the improvement comprising a bearing chamber located intermediate said combustion chamber and said turbine hermetically isolated from other portions of said engine, a dynamic pressure type gas bearing mounted within said bearing member for frictionlessly supporting said main shaft when air under pressure is introduced into said bearing chamber, air passage means for introducing air under pressure from said compressor into said bearing chamber, air outlet means defining a flow path for discharging air from said bearing chamber, and means for regulating the flow of air passing through said outlet means.

3,898,794

POWER PLANT

Hajime Ariga, Yokohama, Japan, assignor to Nissan Motor Company Limited, Japan

Filed Mar. 26, 1973, Ser. No. 344,618
Claims priority, application Japan, Apr. 1, 1972, 47-32808; Apr. 25, 1972, 47-41669
Int. Cl. F02c *3/20*
U.S. Cl. 60—39.18 R **7 Claims**



1. A power plant driven by a flow of high-temperature gases comprising, in combination, a source of hydrogen peroxide, a casing, a feed chamber formed in said casing and communicating with said source of hydrogen peroxide, a combustion chamber formed in said casing and axially aligned with said feed chamber, a catalyst disposed in said casing between said feed chamber and said combustion chamber and decomposing hydrogen peroxide supplied from said source of hydrogen peroxide into said catalyst and producing water vapor and oxygen, a shaft rotatably supported by said casing, said shaft extending into said feed chamber and said combustion chamber, a turbine rotatably connected at one end of said shaft extending into said combustion chamber, a pump rotatably connected at the other end of said shaft extending into said feed chamber, said turbine being driven by a mixed gas of said water vapor and said oxygen gas formed by decomposing said hydrogen proxide, a venturi portion leading from said combustion chamber, a source of fuel communicating with said combustion chamber for supplying thereinto fuel to be combusted by said oxygen gas for producing high-temperature gases, a gas flow passageway communicating with said venturi portion to pass said high-temperature gases therethrough, a turbine wheel having blades exposed to the flow of said high-temperature gases in said gas flow passageway and driven by said flow, a fuel pump disposed between said source of fuel and said combustion chamber for feeding fuel thereinto, a rotary shaft connected at its one end to said fuel pump, a turbine connected to the other end of said rotary shaft, and a water vapor chamber in which said last-mentioned turbine is located, said water vapor chamber communicating with said combustion chamber to receive said water vapor and oxygen, whereby said last-mentioned turbine is rotated thereby driving said fuel pump.

3,898,795

FUEL SUPPLY SYSTEMS FOR ENGINES

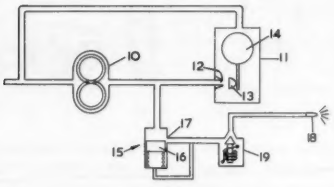
Barrie Gilbert Barker, London, England, assignor to Simms Group Research & Development Ltd., Birmingham, England

Filed Dec. 21, 1973, Ser. No. 427,117

Claims priority, application United Kingdom, Dec. 23, 1972, 59587/72

Int. Cl. F02c 9/10

U.S. Cl. 60—39.28 R 2 Claims



1. A fuel supply system for a gas turbine engine comprising in combination, an engine driven fuel pump having a delivery volume which varies in proportion to engine speed, a spill valve for spilling fuel between the inlet and outlet of the pump, the outlet of the pump being connected to a spray nozzle disposed to direct fuel into a combustion space of the engine, a regulating valve disposed between the spray nozzle and the outlet of the pump and means for controlling the setting of the spill valve in accordance with various engine control parameters, the arrangement being such that the quantity of fuel delivered to the engine depends upon the speed of the engine and the setting of the spill valve, said regulating valve including a pressure responsive valve element subjected to the outlet pressure of the pump and movable by this pressure against the action of resilient means, said regulating valve including an orifice through which fuel flows to said nozzle, said valve member being moved against the action of the spring to increase the size of said orifice with increasing pressure at the outlet of the pump, the valve element also being responsive to the pressure at the nozzle, this pressure assisting the action of said resilient means.

3,898,796

AMBIENT COMPENSATING MEANS

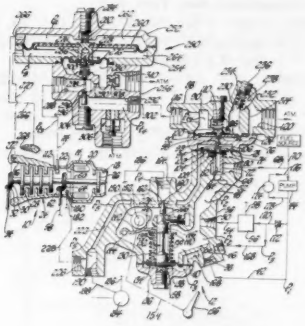
Raymond P. Canale, Warren, and Leon L. Brantman, Royal Oak, both of Mich., assignors to Colt Industries Operating Corporation, New York, N.Y.

Division of Ser. No. 207,063, Dec. 13, 1971, Pat. No. 3,777,481. This application Jan. 11, 1974, Ser. No. 432,566

Int. Cl. F02c 9/10

U.S. Cl. 60—39.28 R 9 Claims

1. Ambient compensating means for use with a turbine engine fuel control which has means responsive to a signal pressure related to a pressure generated by the compressor of said turbine engine for governing the rate of metered fuel flow to said turbine engine, said ambient compensating means comprising valving means adapted to be interposed between said means responsive to said signal pressure and said pressure generated by said compressor, and additional pressure responsive means operatively connected to said valving means, said additional pressure responsive means being adapted to be responsive to changes in engine airflow as affected by ambient conditions for adjustably positioning said valving means in



accordance therewith and correspondingly modify the magnitude of said signal pressure.

3,898,797

COOLING ARRANGEMENTS FOR DUCT WALLS

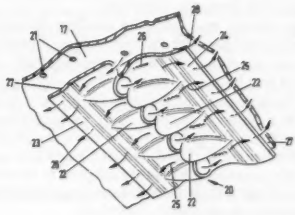
Robert David Wood, Etwall, England, assignor to Rolls-Royce Limited, London, England

Filed July 30, 1974, Ser. No. 493,154

Claims priority, application United Kingdom, Aug. 16, 1973, 38812/73

Int. Cl.[2] F02C 7/18

U.S. Cl. 60—39.66 4 Claims

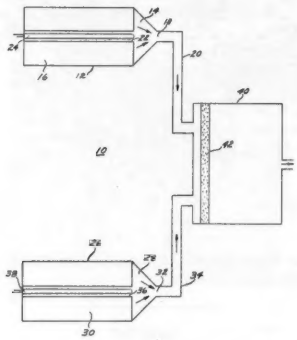


1. A wall structure for a hot duct which duct in use contains or conducts hot fluid and which has a cool fluid on the exterior thereof, the wall structure comprising a wall member, means formed on the inside of the wall member and defining first and second pluralities of discrete pockets, the wall member having at least one aperture for each pocket communicating said pocket with the exterior of the wall member to enable the introduction of the cool fluid into said pocket, each pocket having a mouth for discharging the introduced cool fluid, each mouth of the first plurality of discrete pockets being arranged to discharge said cool fluid substantially in a first direction along the interior of the wall to form a cooling film thereon, each mouth of the second plurality of discrete pockets being arranged to discharge said cool fluid substantially in a second direction along the interior of a wall to form a cooling film thereon, wherein said first and second directions are substantially mutually opposed and the mouths of the first plurality of discrete pockets are interdigitated with the mouths of the second plurality of discrete pockets so that substantially each mouth discharges cool fluid between two mouths of the other plurality.

3,898,798
SUBLIMING SOLIDS BIPROPELLANT FUEL SYSTEM POWER GENERATOR

Laurence O. Williams, Littleton, Colo., assignor to Martin Marietta Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 677,093, Oct. 23, 1967, abandoned. This application Oct. 26, 1972, Ser. No. 301,185
Int. Cl. C06d 5/08, 5/10
U.S. Cl. 60—207 12 Claims



10. The method of producing a high temperature working fluid from a solid fuel which comprises the steps of:

providing a single mass of solid fuel devoid of liquid which has a positive heat of formation and is adapted to sublime with the application of heat to provide a gaseous medium; enclosing said fuel within a gas-tight chamber having an outlet;

applying heat to said fuel in an amount sufficient to produce a gaseous medium with a pressure adequate to force the gases to issue from the chamber;

providing a single mass of solid oxidizer devoid of liquid adapted to sublime with the application of heat to provide a gaseous medium adapted to hypergollicly react with said fuel and having a relatively high vapor pressure;

applying heat to said oxidizer in an amount sufficient to produce a gaseous medium with a vapor pressure adequate to force the gases to issue from the chamber;

passing the issuing fuel and oxidizer gases through a catalytic zone containing a catalyst adapted to decompose the gases with the release of heat to produce a high temperature working fluid; and,

expanding said working fluid through a work conversion means to produce work.

3,898,799
DEVICE FOR BLEEDING-OFF COMPRESSOR AIR IN TURBINE JET ENGINE

Wolfgang Pollert, Hebertshausen; Eckhard Kraft, Munich, and Gregor Pennig, Dachau, all of Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH, Germany

Filed Sept. 27, 1973, Ser. No. 401,544
Claims priority, application Germany, Sept. 27, 1972, 2247400
Int. Cl. F02c 3/06
U.S. Cl. 60—226 R 46 Claims

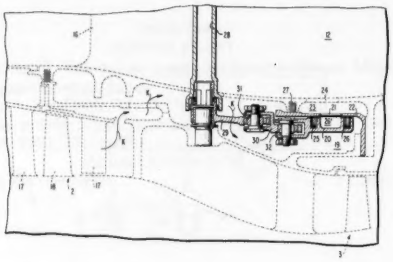
1. Apparatus for bleeding off compressor air in a turbine engine of the type having a longitudinal center line and a plurality of mechanically independent compressors; and apparatus comprising:

a first chamber communicated directly with compressor air from one of said compressors,

an internal ring positioned in said first chamber,

an external ring positioned downstream of said internal ring with respect to air flow through said turbine engine, positioned adjacent and externally of said internal ring with respect to said center line, and including a plurality of openings,

a second chamber communicated with bypass means of the engine which bypass means accommodates air flow therein in bypassing relationship to an engine combustion chamber arranged downstream of said compressors,

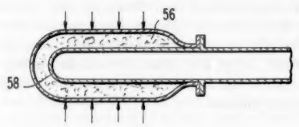


and internal ring actuating means for moving said internal ring between closed positions with said internal ring blocking said openings in said external ring to prevent flow from said first chamber to said second chamber and open positions with said internal ring out of blocking relationship with respect to said openings such that air can flow from said first to said second chamber through said openings.

3,898,800
HEAT ENGINE IN THE FORM OF A WATER PULSE-JET

Peter R. Payne, Box 282, Rt. 5, Annapolis, Md. 21401

Filed May 8, 1973, Ser. No. 358,232
Int. Cl. B63h 11/12; F02k 7/02
U.S. Cl. 60—227 9 Claims



1. A heat engine comprising:

a. a tubular member, said tubular member being completely closed at one end and open at the other to a source of working fluid such that the working fluid has access to said tubular member through the open end thereof;

b. heating means for heating the working fluid at the closed end of said tubular member;

c. a material having high specific heat around the closed end of said tubular member to store heat;

d. a jacketing material having high heat conductivity arranged around said material having high specific heat; and

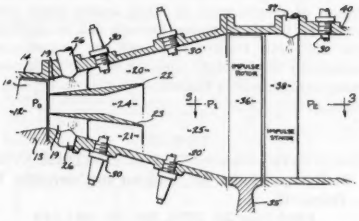
e. cooling means for cooling said tubular member adjacent the open end thereof,

whereby, when said heating means are functioning during use of the heat engine, the working fluid has a liquid and a vapor phase and the working fluid oscillates within the tube as it is alternately vaporized by said heating means and condensed by said cooling means, thereby producing useful power.

3,898,801
REACTION MOTOR EMPLOYING INTERMITTENT EXPLOSIVE COMBUSTION AND IMPULSE TURBINE

Harlow B. Grow, 16530 Chattanooga Place, Pacific Palisades, Calif. 90272

Filed Oct. 30, 1973, Ser. No. 411,092
Int. Cl. F02k 3/10
U.S. Cl. 60—247 18 Claims

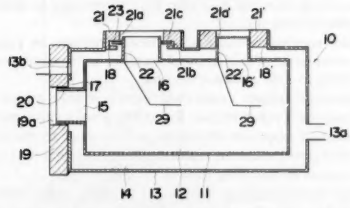


1. A moderate thrust producing gas-turbine including; a compressor section having a working fluid inlet and means discharging compressed working fluid axially at a pressure adapted to support combustion, a nozzle-burner section receiving the axial discharge from said compressor means and comprised of a rearwardly divergent passage conducting the working fluid and with its nozzle area greater than its reception area from the compressor section and having intermittently explosive combustion means for expansion and axial velocity increase of said working fluid, and a turbine section receiving the working fluid from the nozzle-burner section at said axial velocity increase and having a turbine with energy absorbing velocity decreasing and pressure conserving blading driving said compressor and discharging remaining working fluid axially rearward as propulsive thrust.

3,898,802
EXHAUST GAS PURIFYING REACTOR

Tomoo Tadokoro, Kure, and Masayuki Kawata, Hiroshima, both of Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Filed July 2, 1973, Ser. No. 375,478
Claims priority, application Japan, July 3, 1972, 47-66902
Int. Cl. F01n 3/10
U.S. Cl. 60—282 2 Claims

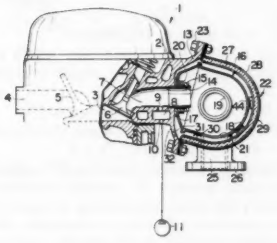


1. A reactor for an internal combustion engine including an engine block, which comprises in combination:
an inner shell forming a reaction chamber therein;
an outer shell surrounding said inner shell and separated therefrom to define a space therebetween;
a pair of intake tubes defining intake passages for introducing exhaust gas from said engine into said reaction chamber;
an exhaust tube means defining an exhaust passage for discharging the exhaust gas from said reaction chamber; said inner and outer shells being rigidly connected with each other by one of said intake tubes to reduce noise and vibration of the reactor during engine operation while the other of said intake tubes is movably connected between said shells for supporting said inner shell to move in the axial and radially outward directions of said other intake due to the heat expansion of said inner shell.

3,898,803
EXHAUST GAS RECOMBUSTION ASSEMBLY FOR AN INTERNAL COMBUSTION ENGINE

Yoshio Sasaki, and Minoru Morita, both of Nagoya, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1974, Ser. No. 475,268
Claims priority, application Japan, Dec. 21, 1973, 48-142339
Int. Cl. F02b 75/10; F01n 3/10
U.S. Cl. 60—305 7 Claims

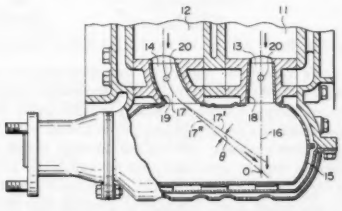


1. An exhaust gas recombustion assembly for an internal combustion engine including an engine housing and exhaust gas outlet ports, said assembly comprising an inner casing defining an exhaust gas recombustion chamber, said inner casing being mounted directly upon said engine housing over said exhaust gas outlet ports to define said recombustion chamber in direct flow relationship with said outlet ports, an outer casing surrounding said inner casing, said outer casing being partially formed from integrally extending wall portions of said engine housing, means for supplying secondary air into said exhaust gas outlet ports, and outlet means for said recombustion chamber whereby exhaust gases and secondary air are introduced directly from said outlet ports into said recombustion chamber with recombusted exhaust gases being discharged therefrom through said outlet means.

3,898,804
STRUCTURE OF AN EXHAUST MANIFOLD OF A ROTARY ENGINE

Minoru Morita, Nagoyo, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 30, 1974, Ser. No. 465,485
Claims priority, application Japan, Jan. 16, 1974, 49-7642
Int. Cl. F01n 3/08
U.S. Cl. 60—323 7 Claims



1. A structure of an exhaust manifold of a multi-rotor type rotary engine which comprises a plurality of rotors, wherein exhaust gases delivered from individual combustion chambers corresponding to individual rotors are introduced into a common manifold reactor, characterized in that the lines of ejec-

tion of individual exhaust ports corresponding to said individual combustion chambers substantially cut one another at a point located within an internal space of the manifold reactor.

3,898,805

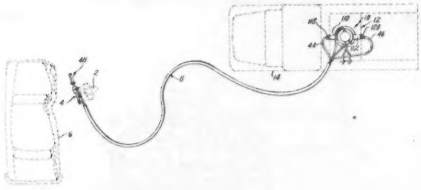
PUMP AND INTENSIFIER UNIT ARRANGEMENT FOR POWERED TOOLS

Lewis B. Good, Jr., 145 Johnson, East Peoria, Ill. 61611

Division of Ser. No. 289,115, Sept. 14, 1972, Pat. No. 3,837,076. This application June 25, 1974, Ser. No. 482,836

Int. Cl. F15b *3/00*

U.S. Cl. 60—325 **9 Claims**



1. In combination, apparatus particularly designed to enable fire department workers to perform effective rescue work, comprising: a fire department pump, designed to pump relatively large quantities of water at relatively low water pressure; a remotely located fluid pressure operated tool; intensifier unit means for converting the relatively low water pressure of said fire department pump into relatively high fluid pressure for operating said tool, said intensifier unit means making it possible to effectively power said tool from said fire department pump and being located remotely from said tool, and comprising: intensifier pump means; water motor means arranged to operate said intensifier pump means; and means connecting said water motor means with said fire department pump; and fluid circuit means connecting said intensifier pump means with said tool.

3,898,806

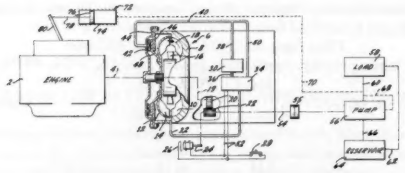
NOISE REDUCTION APPARATUS

Robert J. Press, Pinole, Calif., assignor to Sargent Industries, Inc., Los Angeles, Calif.

Filed May 17, 1974, Ser. No. 470,861

Int. Cl. F16d *33/00*

U.S. Cl. 60—330 **36 Claims**



1. A noise reduction apparatus for operating a variable volume and variable pressure load, said apparatus comprising: pump means having a capacity which is sufficiently large to supply said load at a relatively low pump speed;

engine means operably connected to said pump means through a torque converter and an automatic transmission for supplying power to said pump means in performing a secondary work function at a speed near the idling speed of said engine means;

said torque converter including a converter pump driven by said engine means and a converter turbine connected to said automatic transmission;

lockup means and a governor controlling said lockup means to lock the converter pump to the converter turbine at predetermined intervals during the shift pattern of said automatic transmission when the engine means is performing its primary work function, and

bypass means to bypass said governor and to actuate said lockup means at speeds near the idling speed of said engine means when the engine means is supplying power to said pump means in performing a secondary work function,

whereby the engine means operates in the low noise level region of speeds near its idling speed when supplying power for the pump means through said torque converter and automatic transmission with the torque converter locked up to eliminate slippage between the converter pump and converter turbine.

3,898,807

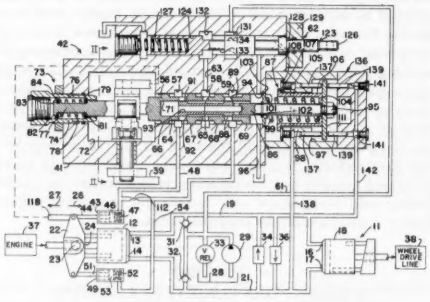
HYDROSTATIC TRANSMISSION CONTROL SYSTEM

Cyril W. Habiger, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 20, 1974, Ser. No. 481,149

Int. Cl.[2] F16H *39/46*

U.S. Cl. 60—391 **12 Claims**



1. A control system for a hydrostatic transmission which has a fluid pump driving a fluid motor through a pair of flow conduits extending therebetween wherein said pump has an element which is movable to vary the volumetric displacement thereof, said control system comprising:

fluid actuator means coupled to said pump element for varying said pump displacement in response to pressurized fluid received by said actuator means,

a control member movable by an operator to select pump displacement,

valve means movable in a first direction in response to movement of said control member to transmit pressurized fluid to said actuator means,

follow-up means connected between said pump element and said valve means for shifting said valve means in a second opposite direction in response to movement of said pump element resulting from movement of said valve means in said first direction, and

load compensating means for shifting said valve means independently of said control member when the fluid pressure differential between said flow conduits reaches a predetermined value.

3,898,808

CONCENTRIC BRAKE BOOSTER WITH ACCUMULATOR

Jerome T. Ewald, and Richard L. Lewis, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed June 20, 1974, Ser. No. 481,090

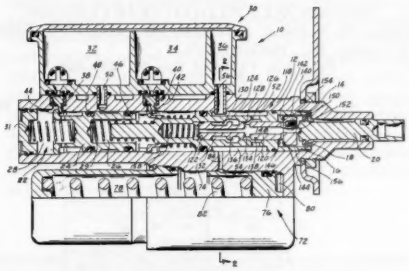
Int. Cl. F15b *20/00*

U.S. Cl. 60—403 **13 Claims**

1. In a vehicle having primary and secondary pressure sources, a hydraulic brake actuating device comprising:

a housing defining a bore therewithin;

a primary piston slidably mounted in said bore and cooperating with one end of the latter to define a variable volume pressure chamber therebetween, said primary piston sliding with respect to said housing to effect a brake actuation when fluid pressure from either of said sources is communicated into said pressure chamber;



operator-actuated valve means for controlling communication from said primary pressure source into said pressure chamber; and

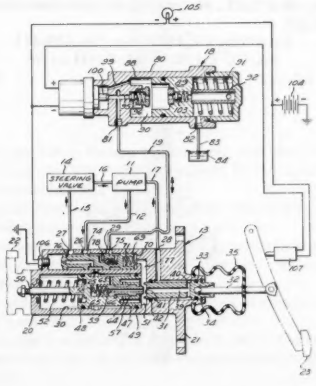
fluid pressure actuated means responsive to a failure of fluid communication from said primary source into said pressure chamber upon actuation of said operator-actuated valve means, said fluid pressure actuated means thereupon initiating communication between said secondary pressure source and said pressure chamber.

3,898,809

MOTOR VEHICLE OPEN-CENTER SERIES HYDRAULIC CIRCUIT WITH ACCUMULATOR

James P. Baker, Portland, Oreg., assignor to The Weatherhead Company, Cleveland, Ohio

Filed Nov. 29, 1973, Ser. No. 419,999
Int. Cl. F15b *1/02, 20/00*
U.S. Cl. 60—404 **16 Claims**



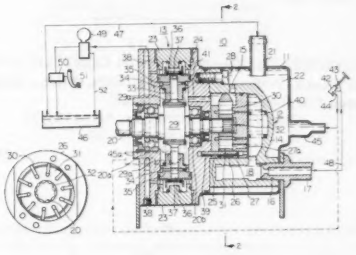
1. A motor vehicle fluid power circuit comprising a pump having an outlet side, a steering valve, a fluid pressure actuated brake booster, and an accumulator, first means hydraulically connecting said pump outlet side to said brake booster and hydraulically connecting said pump outlet side to said steering valve, valve spool means connected in said first means and having one end exposed to the pressure of said pump outlet side and another end exposed to the working pressure in said brake booster, said valve spool means in response to the working pressure in said brake booster on said other end throttling fluid flow from said pump outlet side and maintaining the pressure of said pump outlet side at at least a predetermined pressure differential above the working pressure of said brake booster under normal operating conditions, means hydraulically connecting said pump outlet side to said accumulator for charging thereof under normal operating conditions, means responsive to movement of said valve spool means in response to a fluid pressure failure in said pump pressure on said one end for supplying pressurized fluid from said accumulator to said valve spool means, and in response to said fluid pressure failure in said pump pressure on said one end said valve spool means hydraulically connects said accumulator fluid pressure to said brake booster and hydraulically isolates said accumulator and brake booster from said pump outlet side and steering valve.

3,898,810

TANDEM PUMP UNIT

Motoichi Ohba, and Keiichi Chiba, both of Tokyo, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Apr. 15, 1974, Ser. No. 461,215
Claims priority, application Japan, Apr. 16, 1973, 48-45452
Int. Cl.² F15B *1/02, 11/16*
U.S. Cl. 60—413 **8 Claims**



1. In a motor vehicle having a closed-type hydraulic system, an open-type hydraulic system and a hydraulic fluid reservoir, and a pump unit, said pump unit comprising:

a low pressure pump having a first outlet connected to an inlet of the open-type hydraulic system and a first inlet; a high pressure pump drivable in common with said low pressure pump and having a second outlet connected to an inlet of the closed-type hydraulic system and a second inlet;

an outlet of the closed-type hydraulic system being connected to the fluid reservoir and said first and second inlets communicating with both the fluid reservoir and an outlet of the open-type hydraulic system.

3,898,811

CONTROL LINKAGE FOR DUAL PATH HYDRAULIC DRIVE

David H. Seaberg, Davenport, Iowa, assignor to J. I. Case Company, Racine, Wis.

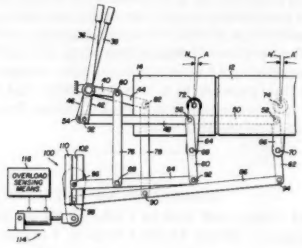
Filed June 20, 1974, Ser. No. 481,027
Int. Cl.² F15B *13/09*
U.S. Cl. 60—421 **20 Claims**

1. In a prime mover, such as a crawler tractor, skid-steer tractor or the like, having a pair of independently operated variable power sources, said power sources having respective displaceable output control arms, wherein the improvement comprises:

a pivotally mounted overload sensing lever having a pair of spaced, parallel guide surfaces extending radially of the pivot axis;

a pair of follower components slideable along the respective lever guide surfaces;

means interconnecting the following components with respective output control arms for displacing the follower components along the guide surfaces from the pivot axis a distance proportional to the power output from the power sources; and



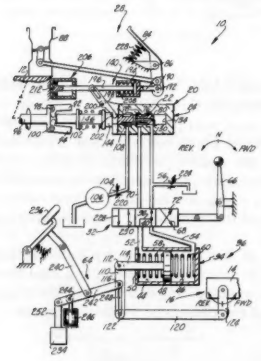
means for pivoting said lever in response to an overload condition and for proportionally reducing the power output from said power sources in accordance with the position of said follower components from said lever pivot axis.

3,898,812

HYDROSTATIC TRANSMISSION CONTROL SYSTEM

Erlen Busch Walton, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed June 17, 1974, Ser. No. 479,672
Int. Cl.[2] F16D *31/00*
U.S. Cl. 60—431 **25 Claims**



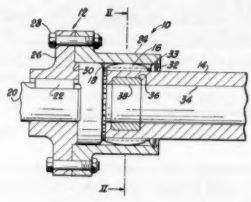
1. An apparatus comprising an engine, selectively settable throttle means for varying the operating speed of said engine, a hydrostatic transmission having a pump unit driven by said engine and a motor unit drivingly connected with an output member, fluid motor means for varying the displacement of at least one of said units of said hydrostatic transmission, valve means for porting fluid to said motor means, said valve means including a valve member which is movable to vary the fluid pressure ported to said motor means, means for applying to said valve member a first force which varies as a function of the operating speed of said engine and which urges said valve member in a first direction, means for applying to said valve member a second force which varies as a function of throttle setting and which urges said valve member in a second direction opposite from said first direction, and means for applying to said valve member a third force which varies as a function of the fluid pressure conducted to said motor means from said valve means and which urges said valve member in said second direction.

3,898,813

DYNAMICALLY PILOTED GEAR COUPLING

Michael M. Calistrat, Sykesville, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed July 17, 1974, Ser. No. 489,401
Int. Cl. F16d *3/18*
U.S. Cl. 64—9 R **10 Claims**



1. A dynamically piloted gear coupling comprising:

spool means having external spur gear teeth around its outer periphery;

sleeve means surrounding said spool means and having internal spur gear teeth around its inner periphery in driving engagement with said external teeth; and

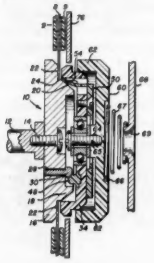
dynamic piloting means within said spool means operative upon rotation of said coupling to diametrically expand said spool means for maintaining piloted engagement between said external and internal gear teeth.

3,898,814

MECHANISM FOR CLAMPING AND DRIVING A FLEXIBLE DISC

Albert S. Chou, Monte Sereno; Yang Hu Tong, San Jose; Harold C. Medley, Los Gatos, and Warren L. Dalziel, Monte Sereno, all of Calif., assignors to Shugart Associates, Sunnyvale, Calif.

Filed May 13, 1974, Ser. No. 469,411
Int. Cl.[2] G11B *25/04*; **F16H** *13/00*
U.S. Cl. 64—22 **10 Claims**



1. A mechanism for clamping and driving a flexible disc comprising:

a rotatable spindle formed to include a camming surface, a first disc clamping surface, and a disc registration surface, said spindle being rotatable about an axis; and

clamping means including a second disc clamping surface and a registration engaging surface, said clamping means being rotatable about said axis and movable along said axis from a disc loading position to a disc clamping posi-

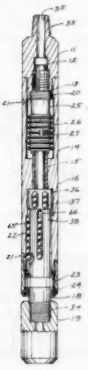
tion and further including means responsive to spindle rotation and operative to positively transmit said spindle rotation to said clamping means, said clamping means additionally including guide means responsive to misalignment of the inner periphery of said disc relative to said axis when said disc is loaded between said spindle and said clamping means and operative to engage a portion of said inner periphery that contacts said camming surface as said clamping means moves from said disc loading position into a position intermediate said loading and said clamping positions, said guide means serving to cam said inner periphery along said camming surface and into registration with said disc registration surface, whereby when said clamping means is in said clamping position, said disc is clamped between said first and second clamping surfaces and said means responsive to spindle rotation is positively registered with said spindle such that rotation of said spindle is positively transmitted to said clamping means.

3,898,815

PRESSURE AND VOLUME COMPENSATING SYSTEM FOR RECIPROCATING OIL FIELD DRILLING TOOLS

James Whitehurst Young, Irving, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 6, 1973, Ser. No. 422,240
Int. Cl. F16d *3/06*
U.S. Cl. 64—23.7 **3 Claims**



1. A reciprocating torque transmitting well tool for operation in a borehole filled with a borehold fluid, comprising:

an outer member;

an inner member, said outer member and said inner member being telescopically arranged;

spline means comprising a multiplicity of balls in matching raceways between said outer member and said inner member for transmitting torque;

a lubricating fluid between said inner member and said outer member;

spring means comprising a multiplicity of disc springs connected to said outer member and connected to said inner member;

first seal means between said outer member and said inner member for providing a fluid seal between said lubricating fluid and said borehole fluid; and

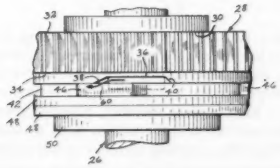
second seal means between said outer member and said inner member for providing a fluid seal between said lubricating fluid and said borehole fluid, said second seal means including a multiplicity of annular inner seals surrounding said inner member, a retainer element extending around said inner seals, a multiplicity of annular outer seals surrounding said retainer element, and means for providing said seal means with a limited amount of axial movement.

3,898,816

CLUTCH HAVING ROTATABLE POWER TRANSMITTING PARTS WHICH SHIFT RELATIVE TO EACH OTHER AT VARIABLE TORQUE LOADS

Robert E. Lindahl, Elkhart, and Charlie N. French, South Bend, both of Ind., assignors to Masco Corporation of Indiana, Elkhart, Ind.

Filed Jan. 9, 1974, Ser. No. 432,087
Int. Cl. F16d *3/56*
U.S. Cl. 64—29 **3 Claims**

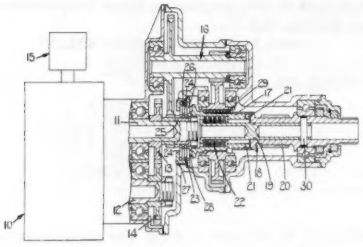


1. In a clutch member including a shaft part rotatable about a longitudinal axis, a power transmitting part journaled upon said shaft part for rotation relative to the shaft part about said longitudinal axis, said power transmitting part having an end face the plane of which is generally perpendicular to the said longitudinal axis, said end face having a pair of opposingly spaced first and second shoulder means defining a groove therebetween, said groove being spaced spaced from said longitudinal axis, arm means anchored to said shaft part and fitting within said groove, said arm means abutting said first shoulder means to cause said power transmitting part and shaft part to rotate as a unit about said longitudinal axis when one of said shaft and power transmitting parts is rotated in one direction of rotation, said arm means abutting said second shoulder means to cause said power transmitting part and shaft part to rotate as a unit about said longitudinal axis when said one power transmitting or shaft part is rotated in the opposite direction of rotation, each of said first and second shoulder means being beveled relative to the plane of said end face, means yieldably urging said arm means into said groove wherein the arm means will be caused to ride over said first and second shoulder means to cause relative rotative movement between said shaft and power transmitting parts when a specific torque between said shaft and power transmitting parts is exceeded, the improvement wherein the angle of bevel of said first shoulder means exceeds the angle of bevel of said second shoulder means, the respective angles of bevel of said first and second shoulder means being determinative of said torque at which said power transmitting and shaft parts experience said relative rotative movement, said relative rotative movement between said shaft and power transmitting parts occurring in said one direction of rotation at a higher torque than the torque at which such relative rotative movement between such parts occurs in said opposite direction of rotation.

3,898,817
ACTUATOR WITH A TORQUE LIMITING DEVICE

Terence John Capewell, Brewood, and Donald Craven, Wolverhampton, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Feb. 11, 1974, Ser. No. 441,447
Claims priority, application United Kingdom, Feb. 20, 1973, 8210/73
Int. Cl. F16d 7/02
U.S. Cl. 64—30 E 7 Claims

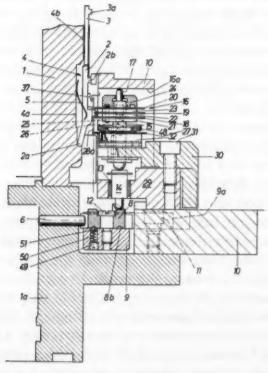


1. A rotary actuator comprising a housing, a drive shaft journalled in the housing, a coaxial output shaft journalled in the housing, a coaxial coupling member movable axially of the drive and output shafts, a reduction gear train connecting the drive shaft to the coupling member, coupling means between the coupling member and the output shaft arranged to transmit power from the coupling member to the output shaft and to cause axial displacement of the coupling member when the torque transmitted through the coupling means exceeds a predetermined value, and a brake on the drive shaft arranged to be actuated by such axial displacement of the coupling member.

3,898,818
PATTERN MEANS FOR CIRCULAR KNITTING MACHINES AND METHOD FOR OPERATING SAME

Gerhard Schmidt, Stuttgart, Germany, assignor to Firma Franz Morat GmbH, Stuttgart-Vaihingen, Germany

Continuation of Ser. No. 162,819, July 15, 1971, abandoned. This application Aug. 22, 1973, Ser. No. 390,342
Claims priority, application Germany, Jan. 21, 1971, 2102719; Apr. 15, 1971, 7114392
Int. Cl. D04b 15/74
U.S. Cl. 66—50 B 10 Claims

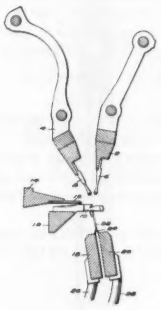


1. A knitting machine comprising a circular needle cylinder having a plurality of guides, knitting elements arranged within said guides, spring means for selecting desired knitting elements for knitting a pattern, control means facing said needle cylinder and provided with guide traces for causing selected knitting elements to knit when said needle cylinder and said control means are moved relative to each other, at least one pattern device acting on said spring means for selecting the desired knitting element, said pattern device being movable relative to said needle cylinder and including at least two rotatable pattern elements provided on their circumferences with means for acting on said spring means, means for positioning said pattern elements in a working position for acting on said spring means or in a non-working position, means for positioning only one of said pattern elements in the working position, automatic means for moving another pattern element into the working position after a previously selected number of spring means have passed said pattern device while moving relative to said needle cylinder, whereby each of said pattern elements are selectively brought into the working position in such a sequence that all pattern elements jointly participate in the production of one pattern.

3,898,819
WARP KNITTING MACHINE

Siegfried F. Brand, RFD 1, Hayes Dr., Yorktown Heights, N.Y. 10598

Continuation-in-part of Ser. No. 838,075, July 1, 1969. This application Sept. 7, 1971, Ser. No. 178,505
Int. Cl.[2] D04B 23/02
U.S. Cl. 66—87 10 Claims

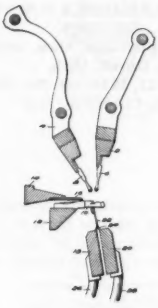


1. A method of knitting novel fabrics on a knitting machine having a row of sinkers, rigidly mounted guide needles disposed above said sinkers, and a row of stitch needles below said sinkers and movable upwardly and downwardly relative to said sinkers, said method comprising, in any sequence a motion described by moving a first portion of the total number of said stitch needles in unison between said sinkers, forming a stitch on said stitch needles of said first portion without forming a stitch on the remainder of said stitch needles, and a motion described by moving a second portion of said stitch needles in unison between said sinkers, forming a stitch on said second portion of stitch needles without forming a stitch on said first portion stitch needles, and simultaneously moving said stitch needles of said first portion and said stitch needles of said second portion between said sinkers forming a stitch on said first and said second portion of stitch needles, said individual stitch needles employing a spacing sufficient to allow said rigidly mounted guide needles to clear when both said first portion and said second portion of stitch needles are simultaneously raised.

3,898,820
WARP KNIT FABRICS

Siegfried F. Brand, RFD 1, Hayes Dr., Yorktown Heights, N.Y. 10598

Division of Ser. No. 178,505, Sept. 7, 1971, which is a continuation-in-part of Ser. No. 838,075, July 1, 1969, abandoned. This application July 12, 1973, Ser. No. 378,758
Int. Cl.[2] D04B *21/00*
U.S. Cl. 66—195 3 Claims



1. A single-faced warp knit fabric, having off-set appearing course lines and produced on a warp knitting machine having two guide bars and a split needle bar, the front and back portion of said split needle bar moving alternately, both of said guide bars having one end drawn, and one end missing, said fabric having the following stitch construction:

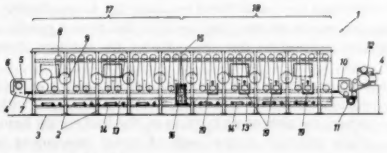
Front Guide Bar	1–2,	II–III,	3–4,	IV–V,	4–3,	III–II
Back Guide Bar	4–5,	IV–III,	3–2,	II–I,	2–3,	III–IV
Active Needle Bar	I	II	I	II	I	II

where Arabic numberals indicate front-needle-bar-knitting and Roman numerals indicate back-needle-bar-knitting.

3,898,821
TREATMENT CHAMBER FOR A CONTINUOUSLY MOVING WEB

Johannes Kutz, St. Tonis, near Krefeld, Germany, assignor to Eduard Kusters, Krefeld-Forstwald, Germany

Filed July 2, 1973, Ser. No. 375,743
Claims priority, application Germany, July 6, 1972, 2233308
Int. Cl. F26b *25/00*
U.S. Cl. 68—5 E 8 Claims



1. A treatment chamber for treating a continuously moving web of textile material comprising:

a. an elongated treatment chamber having means for directing the moving textile web in a winding path therethrough;

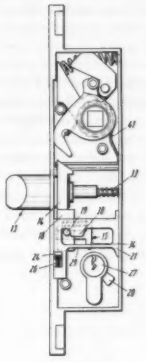
b. means including at least one wall and a lock through which the web passes for separating said elongated chamber into a plurality of at least to sub-chambers, said lock being operable to be opened, to allow free passage of the atmosphere from one chamber to the other and closed to seal one chamber from the other; and

c. means to individually and selectively provide a treatment atmosphere to each of the subchambers.

3,898,822
MORTISE LOCK

Wolfgang Schalm, Senne, Germany, assignor to Schuco Heinz Schurmann & Co., Bielefeld, Germany

Filed Aug. 8, 1973, Ser. No. 386,739
Claims priority, application Germany, Aug. 10, 1972, 2239390
Int. Cl. E05b *55/06*
U.S. Cl. 70—143 11 Claims



1. A mortise lock, comprising a housing; a latch bolt movable in a first direction out of and into said housing between an advanced dead-lock position, an intermediate latching position and a retracted position; a catch slidably mounted in said housing and extending over the entire width thereof into slidable guided, engagement with the width-defining housing walls for shifting movement between a normal rest and a shifted position in a second direction transverse to said first direction and having a cutout provided with a dead-lock part and a latching part, the two parts being spaced in said first direction, and an abutment separating said two parts and extending partly across said cutout in said second direction; a connector on said latch bolt, movable therewith and having a pin extending into said cutout, and an engaging portion; a biasing spring biasing said catch to said rest position; a lock cylinder mounted in said housing for turning movement between two positions in one of which it displaces said catch to said shifted position wherein said pin may move past said abutment from one cutout part to the other; means for moving said latch bolt between the several positions and including a handle-operated member operative to engage said engaging portion and displace said latch bolt to said retracted position, only when said latch bolt is in said intermediate position or inbetween these two positions.

3,898,823
DEVICE FOR RESILIENTLY LOCKING AIRCRAFT CONTROLS

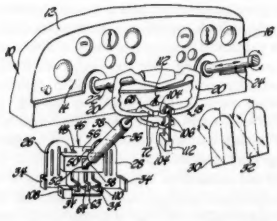
Russell S. Ludeman, 982 Miller Rd., Lake Orion, Mich. 48035

Filed July 23, 1973, Ser. No. 381,905
Int. Cl.[2] B64C *13/14*
U.S. Cl. 70—200 4 Claims

1. In combination, an aircraft with controls for rudder, aileron and elevator flight control surfaces, said controls comprising at least one foot-operated rudder pedal and a hand-operated column and wheel for controlling the elevators and ailerons, respectively, and a device for securing said aircraft against rudder, elevator and aileron wind damage, said device comprising a member attached to said pedal, an element attached to said wheel and a telescoping element attached to

and extending between said member attached to said pedal and said element attached to said wheel, said device having resilient means for maintaining a predetermined free length thereof, but permitting either extension or contraction thereof against a resilient resisting force provided by said resilient means, whereby the rudder, elevator and aileron surfaces are restricted against free movement but at least one of the surfaces are permitted some degree of resiliently resisted movement.

3. A device for securing against theft and flight control surface wind damage an aircraft having at least one foot-operated rudder pedal and a hand-operated column and wheel for controlling the elevators and ailerons, said device comprising a member attachable to said pedal, an element attachable to said wheel and a telescoping element attached to and extending between said pedal member and said wheel element, said telescoping element having means for maintaining a predetermined free length thereof but permitting extension or contraction thereof against a resilient resisting force, whereby said rudder, elevator and aileron flight control surfaces are restricted against free movement but permitted some degree of resiliently-resisted movement, said telescoping element coprising a cylindrical tube and a cylindrical rod received therein with clearance, said pedal member comprising a body having oppositely disposed slots formed therein separated by a web, said oppositely disposed slots being adapted to receive the adjacent edges of spaced rudder pedals, said web having



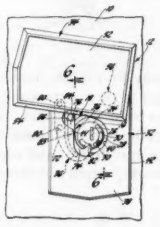
a slot formed therein with diverging sides, said pedal member being secured to one end of said tube by means of a connecting member having one end received in said web slot and secured therein by a pivot pin so that said pedal member is pivotable thereon to the extent permitted by said divergent sides, the other end of said connecting member being cylindrical and received in and secured to said tube, the other end of said tube being closed by a cylindrical bushing spring seat member having a portion thereof received in and secured to said tube, said bushing having an axial opening therethrough slidably receiving said rod, the free end of said rod within said tube being secured to a disc-like spacer spring seat member slidable within said tube, at least one free disc-like spacer spring seat member slidable in said tube on at least one side of said disc connected to said rod, at least one helical coil spring disposed in said clearance between said spring seats, the free end of said rod disposed outside said tube being connected to said wheel element, said wheel element comprising a generally "U" shaped body having a base, spaced legs extending from said base with a slot therebetween, said slot being adapted to receive therein said wheel, at least said pedal member or said wheel element having an opening therein to receive a padlock to secure the same to said pedals or said wheel, respectively, the free length of said device between said pedal member and said wheel element slots being substantially the same as the distance between the pedals and the wheel in their neutral positions.

3,898,824

DETENTED COVER ASSEMBLY FOR VEHICLE DECK LID LOCK

Hans J. Borlinghaus, Clarkston, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 21, 1974, Ser. No. 499,271
Int. Cl.[2] E05B *17/18*
U.S. Cl. 70—455 **3 Claims**



1. In a vehicle body deck lid supporting a lock including a rotatable key cylinder with an outwardly facing key opening for receiving an appropriate key to permit unlocking rotation of the cylinder, a detented cover assembly for the lock comprising:

an escutcheon mounted on the deck lid over the lock and defining an aperture allowing the key to be inserted into the key cylinder;

a cover pivotally mounted on the escutcheon for movement between a closed position covering the aperture in the escutcheon so as to shield the lock from the environment and an open position where the key may be inserted through the escutcheon and into the key cylinder;

spring means biasing the cover to the closed position;

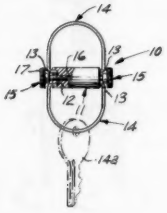
a cam carried by the key cylinder for rotation therewith; and

a leaf spring mounted on the escutcheon and including engagement and detenting portions integral with each other, the detenting portion of the leaf spring being normally located in the path of cover movement toward closed position so as to engage and hold the cover in open position against the bias of the spring means, the engagement portion of the leaf spring being engaged by the cam on the key cylinder during unlocking rotation thereof so as to move this portion of the spring outwardly away from the deck lid, and the juncture of the engagement and detenting portions engaging the escutcheon so as to be restrained from outward movement with the engagement portion in a manner that causes the detenting portion to concomitantly move inward toward the deck lid so as to disengage the open cover and allow closing movement thereof under the bias of the spring means.

3,898,825
KEY RING

Frank E. Taylor, P.O. Box 756, Wichita, Kans. 67201

Filed Oct. 24, 1974, Ser. No. 517,408
Int. Cl.[2] A47G 29/10
U.S. Cl. 70—456 R 3 Claims

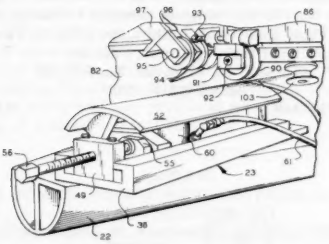


1. A key ring, comprising a cylinder, a pair of U-shaped wire clips removeably received on said cylinder and a pair of thumbscrews received by said cylinder providing positive retainment means for said wire clips receiving keys.

3,898,826
NON-ROTATING TWO-PART MANDREL AND A METHOD OF FORMING SPIRAL-SEAMED PIPE

Jack P. Lombardi, R.D. Duguid Rd., Manlius, N.Y. 13104

Filed Sept. 12, 1974, Ser. No. 505,505
Int. Cl. B21c 37/12
U.S. Cl. 72—49 6 Claims



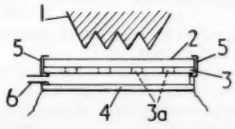
1. A non-rotating two-part mandrel for forming spiral seamed pipe from a formed strip of metal received from a forming mill having synchronously driven rollers for forming an upstanding male locking hook along one edge and an upstanding and downwardly opening female locking hook along the opposite edge, comprising:

a substantially semi-cylindrical lower mandrel part secured at its inner end to a support tower projecting horizontally under the forming mill, a bending roller on the tower for bending the strip downward, the lower part having at its outer end a flat upper surface and a curved side surface on the far side of the advancing strip adapted to angularly guide the strip as it is received from the mill, an upper mandrel part having a flat lower surface plate at its outer end, a pivot pin projecting vertically upward from the flat upper surface through the surface plate and secured to one of the mandrel parts, a way formed longitudinally on the surface plate and carrying a slide adjustable along the way, the slide carrying a guide plate curved substantially about the midline of the surface plate and adjustable up and down with respect to the plate, the surface plate being angularly adjustable about the pivot pin with respect to the mandrel lower part for forming pipes of different diameters, means for locking the plate in angularly adjusted position, a turntable in the way linked to the slide and carrying a lower pinch roll, the turntable being angularly adjustable with respect to the way and lockable in adjusted position, the lower pinch roll being adjustable up and down with respect to the surface plate, the lower mandrel post being positioned with respect to the forming mill so that the female hook of the advancing strip passes over the locking pin, the guide plate being adapted to angularly guide the strip so that the male hook of the strip on each succeeding turn of the strip about the mandrel is aligned with and enters the opening of the female hook of the preceeding turn, and an upper pinch roll rotatably carried by the tower, the pinch rolls being adjustable for continuously clinching the hooks into a spiral seam as the strip is fed around the mandrel.

3,898,827
FORMING OF SUPERPLASTIC ALLOY SHEET

Colin John Swanson, Bristol, England, assignor to ISC Alloys Limited, London, England

Filed Aug. 15, 1973, Ser. No. 388,418
Claims priority, application United Kingdom, Aug. 16, 1972, 38246/72; Oct. 2, 1972, 45327/72
Int. Cl. B21d 26/04
U.S. Cl. 72—60 9 Claims

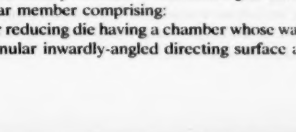


1. A method of moulding superplastic alloy sheet material, comprising: holding a blank of sheet material in a substantially fluid-tight manner on top of and in contact with a plate having a plurality of apertures therein and heated by a heat source remote from the plate; heating the blank to a temperature at which is exhibits superplasticity; and applying fluid pressure to the blank through the apertures in the plate to cause the heated sheet to conform to the shape of a projecting mould surface situated above the sheet.

3,898,828
DIE ASSEMBLY AND METHOD FOR INTERIOR ROLL-NECKING-IN A TUBULAR MEMBER

Eugene Cassai, Hackensack; Andrew Halasz, Pompton Plains, both of N.J., and Edward Herman Hanke, Barrington, Ill., assignors to American Can Company, Greenwich, Conn.

Filed Oct. 1, 1973, Ser. No. 402,602
Int. Cl.[2] B21D 41/02
U.S. Cl. 72—117 12 Claims



1. A die assembly for interior roll-necking-in an end portion of a tubular member comprising:

an outer reducing die having a chamber whose walls include an annular inwardly-angled directing surface and an an-

nular rim-forming surface adjoining and axially interior of said directing surface,

a rotatable spindle assembly concentrically mounted within said outer reducing die, said spindle assembly including

a. an axially-movable elongated plunger having cam surfaces thereon,

b. a hollow spindle having pilot mounting means thereon,

c. a pilot, said pilot including

i. a cylindrical housing mounted onto said pilot mounting means, said housing having inner and outer end walls, a circumferential sidewall, a bore running from said inner end wall axially through said housing for receiving said plunger, a slot, and a slot extension formed in said side wall, said slot communicating axially with said bore and extending radially from said bore through said slot extension,

ii. a free-wheeling roller mounted within said housing in a manner that the axis of said roller is parallel to the axis of said housing, said roller including a frustoconical portion and an adjoining axially-interior cylindrical portion, the circumferential profile of said roller substantially corresponding to the profile of said outer reducing die chamber surfaces,

iii. means for mounting said roller within said housing slot so that its axis is parallel to that of said housing and so that said roller is radially movable within said slot,

iv. biasing means for biasing said roller radially inward toward said plunger,

v. means for moving said roller radially outward to allow the outer surfaces of said frustoconical and cylindrical roller portion to protrude through said slot extension in said side wall to allow the surfaces of said roller portions to engage the interior wall surfaces of a tubular member placed within the outer reducing die, and

vi. means for axially retaining said roller mounting means within said slot;

vii. means for rotating said pilot housing; and means for independently advancing and retracting said plunger such that when a marginal edge portion of said tubular member is within said reducing die chamber, all of said previously recited means cooperate to move said roller axially outward and cause it to spin against and neck-in said portion of said tubular member and to move said roller radially inward away from said necked-in portion so that said necked-in portion clears said roller when said tubular member is withdrawn from said die assembly.

3,898,829

SPARK PLUG ADJUSTING TOOL

Richard M. Sydow, 836 Daniel Dr., Petaluma, Calif. 94952

Filed Nov. 23, 1973, Ser. No. 418,246

Int. Cl. B21d *26/02*

U.S. Cl. 72—125 **2 Claims**

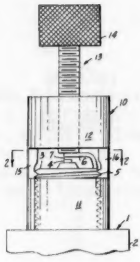
1. A tool for adjusting the spacing between the electrodes of a spark plug comprising:

a mount,

said mount being internally threaded at one end for threaded engagement with the external threads of said plug for securing said mount to said plug,

an adjusting screw threadedly secured to the opposite end of said mount for movement toward and away from one of said electrodes for deforming said one electrode toward another electrode,

said mount being formed with relatively narrow connecting pieces connecting said opposite ends to provide spaces



between said pieces to permit insertion of a gage therethrough.

3,898,830

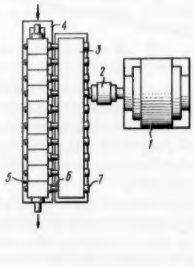
ROLL STAND

Gleb Pavlovich Borisenko, ploschad Oktyabrskaya, 7, kv. 28; Jury Sergeevich Chernobrivenko, ulitsa Dzerzhinskogo, 16, kv. 7; Jury Georgievich Kutsov, ulitsa Kirova, 8, kv. 9; Arkady Alexeevich Gorbanev, ulitsa Serova, 1-a, kv. 4; Oleg Nikolaevich Kukushkin, ulitsa Suvorova, 13, kv. 21; Vladimir Nikolaevich Krivobokov, ulitsa G. Pushkina 1b, kv. 21; Grigory Gavrilovich Pobegailo, pereulok Uritskogo, 11, kv. 3, and Vitaly Dmitrievich Nashivanko, ulitsa G. Pushkina, 1b, kv. 57, all of Dnepropetrovsk, U.S.S.R.

Filed Sept. 16, 1974, Ser. No. 506,747

Int. Cl. B21b *35/00*

U.S. Cl. 72—249 **4 Claims**

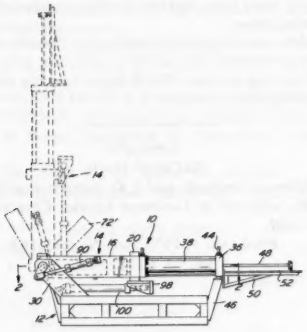


1. A roll stand of unit-design mill for rolling metal bars, comprising: three rolls including one work roll and two similar idle rolls; a drive shaft for rotating said work roll and for transmitting energy required for deformation of the bar being rolled; said idle rolls being each installed on a stationary axle, said axle being made hollow and having an electric stator winding positioned thereon in the hollow of said roll and being connected to an alternating current power supply, a circular insert of an electrically conductive material being installed on the internal surface of said roll opposite to said stator winding, an air gap being provided between said stator winding and circular insert, thereby forming an electric motor in each said idle roll for accelerating the latter.

3,898,831
EXTRUSION APPARATUS

Karl W. Kahlefeld, Philadelphia, Pa., assignor to Loomis Products Company, Levittown, Pa.

Filed Feb. 6, 1974, Ser. No. 440,211
Int. Cl.[2] B21C 23/04
U.S. Cl. 72—263 10 Claims

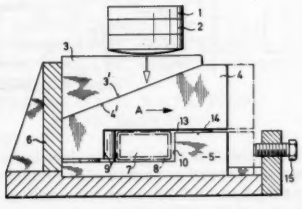


1. Extrusion apparatus comprising a base, a frame pivotably mounted on said base for movement about a transverse horizontal axis from a generally horizontal position to a generally vertical position, a die supported on said frame for movement therewith, a hollow container for supporting material to be extruded through the die, said container being supported on said frame for pivotable movement with said frame about said axis, means supporting said container for independent pivotable movement about said axis, a first motor means connected to said frame for selectively pivoting said frame and container as a unit about said axis for selective extrusion in a horizontal or vertical direction, and second motor means connected to said container for selectively and independently pivoting said container about said axis relative to said frame to facilitate loading of material into said container.

3,898,832
TOOL FOR BENDING WORKPIECES SUCH AS TUBES AND SECTIONS

Gerd-Jürgen Eckold, St. Andreasberg, and Hans Maass, Bad Lauterberg, both of Germany, assignors to Paweck AG, Chur, Switzerland

Filed Sept. 9, 1974, Ser. No. 504,662
Claims priority, application Germany, Sept. 7, 1973, 2345138; Nov. 12, 1973, 2356451
Int. Cl.[2] B21D 7/06
U.S. Cl. 72—389 9 Claims

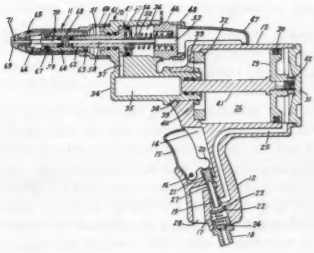


1. A tool for bending workpieces such as tubes and sections, and for use in machines in which the ram strokes occur in rapid succession, comprising: superimposed lower and upper clamping plates; resilient means located between said plates for maintaining them in a slight spaced-apart relationship; a holder within which said plates being disposed for horizontal shifting movement; said plates being shaped at their mutually facing surfaces to form a cavity corresponding to the cross-section of a particular workpiece to be bent; counter-pressure elements on said holder spaced outwardly of said plates against which the workpiece bears; a pressure plate superimposed over said upper clamping plate for contact by the ram, the mutually facing surfaces of said upper plate and said pressure plate being correspondingly sloped in the same direction; the cavity having opposing vertical walls between which the workpiece is disposed, one of said walls in the direction of bending lying outwardly of the inner surfaces of said counter-pressure element; and the tool being such that each time the ram pressure is applied to said pressure plate, said clamping plates and the workpiece are shifted in the horizontal direction of bending opposite the corresponding slope of said upper plate and said pressure plate surfaces, the workpiece being shifted against the resistance of said counter-pressure elements over a distance corresponding to the effective stroke of the ram.

3,898,833
AIR-HYDRAULIC RIVET GUN

Russell F. Richardson, St. Paul, Minn., assignor to Textron Inc., Providence, R.I.

Filed Apr. 15, 1974, Ser. No. 460,729
Int. Cl. B21j 15/22
U.S. Cl. 72—391 5 Claims

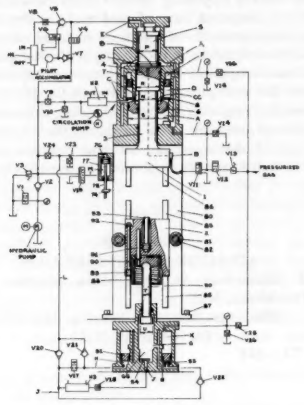


1. A rivet gun for setting blind rivets, said gun comprising:
A. a setting head for engaging and pulling the mandrel of a blind rivet,
B. a body including force exerting means for applying pulling force to said setting head, the direction of said force being generally longitudinal of said body,
C. said force exerting means comprising
1. a first hydraulic pressure chamber within said body having a piston reciprocable therein generally longitudinally of the body,
2. stem means movable with said piston in the same direction,
3. means connecting said stem means to the setting head to operate the same,
4. a second hydraulic pressure chamber disposed within said body in parallel closely spaced apart relation to the first chamber, said chambers being connected through an intercommunicating passage within said body,
5. a piston reciprocable in said second chamber,
6. a third pneumatic pressure chamber within said body in axial alignment with said second chamber,
7. a piston reciprocable in said third chamber and connected to the piston in said second chamber for simultaneous movement thereof,
8. means adapted to connect said third chamber to a source of gas under pressure, and
9. means to regulate flow of gas to said third chamber,
D. a pistol grip handle on said body adjacent to said third chamber.

3,898,834
HIGH ENERGY FORGING PRESS

Kurt H. Kramer, 601 West Ave., Sewaren, N.J. 07077

Continuation-in-part of Ser. No. 886,130, Dec. 18, 1969, abandoned. This application Aug. 10, 1971, Ser. No. 170,599
Int. Cl. B21j 9/12
U.S. Cl. 72—453 27 Claims

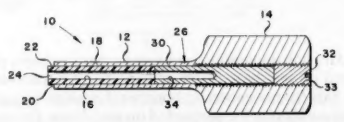


1. A forming machine comprising in combination,
a first tooling member,
a second tooling member,
a common frame,
said first and second tooling members being adapted to reciprocate along a common axis on said machine,
said first and second tooling members provided with means for attaching forming dies to their adjacent surfaces,
primary piston chamber means arranged together with said first tooling member confining primary pressure gas which through expansion is adapted to urge said first tooling member in direction toward said second tooling member,
primary stopping means limiting expansion of said primary pressure gas and limiting distance of travel of said first tooling member in direction toward said second tooling member without disabling said machine wherby an end of stroke position for said first tooling member and a corresponding normal expanded condition of said primary pressure gas are determined independently of second tooling member motion or position,
reset means adapted to compress said primary pressure gas from said normal expanded condition and cause said first tooling member to move from said end of stroke position in direction away from said second tooling member to a beginning stroke position,
stroke initiating means adapted to release said primary pressure gas from said compressed condition and said first tooling member from said beginning stroke position whereby said primary pressure gas propels said first tooling member against said primary stopping means and said primary stopping means operates to limit rest position and whereby said first tooling member is actuated to strike a forming blow against said second tooling member positioned for forming,
secondary piston chamber means arranged in association with said second tooling member,
fluid control means adapted to regulate fluid in said secondary piston chamber means whereby said secondary piston chamber means is caused only in response to operator controlled signal to move said second tooling member along said common axis in direction toward said first tooling member to forming position and whereby said secondary piston chamber means is caused to maintain said second tooling member at said forming position,
said fluid control means adapted to allow said secondary piston chamber means to yield to said induced second tooling member motion and sustain said motion after a single forming blow while first tooliing member motion is being curtailed by said primary stopping means whereby said second tooling member is caused to separate completely away from said first tooling member after a single forming blow,
secondary stopping means limiting the distance said second tooling member may travel in direction away from said first tooling member after a single forming blow without disabling said machine.

3,898,835
BACKUP TOOL

Gordon Winter, Burbank, and J. O. Adcock, Sun Valley, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Oct. 1, 1973, Ser. No. 402,183
Int. Cl. B21j 15/38
U.S. Cl. 72—465 9 Claims

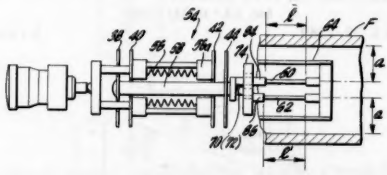


1. A tool comprising
an elongated rigid body member having ends and an axial bore extending therethrough,
a tubular resilient insert mounted in said bore and being slidably secured by press fitting within said bore and having an end portion protruding from said one of said ends, and
means mounted in said bore opposite said tubular insert for adjustably fixing the position of said insert relative to said one of said ends.

3,898,836
DIFFERENTIAL DILATOMETER

Gerhard R. Clusener, Port Washington, N.Y., assignor to Theta Industries, Inc., Port Washington, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,592
Int. Cl. G01n 25/16
U.S. Cl. 73—16 10 Claims



1. A differential dilatometer for simultaneously measuring in a furnace the thermal properties of two samples, one with respect to the other, said dilatometer comprising:
a. a linear variable differential transformer including coil means and a core freely floating therein;
b. first and second cantilevered spring means for independently supporting said coil means and said core with respect to each other;
c. first and second push rods of substantially equal length coupled to said coil means and said core, respectively, and symmetrically with respect to the wall of the furnace;

d. feed means positioned in opposition to said core, for axially displacing said core with respect to said coil means to achieve electrical zero and thereby compensate for differences in length of said first and second push rods;
e. gauge means adapted to be positioned between said feed means and the end of said coil that is in opposition thereto to provide a known separation between said feed means and said coil; and
f. means for maintaining one of the samples in contact with each of said push rods.

3,898,837

METHOD OF AND DEVICE FOR THE IDENTIFICATION AND REDUCTION OF PEAKS IN CHROMATOGRAMS

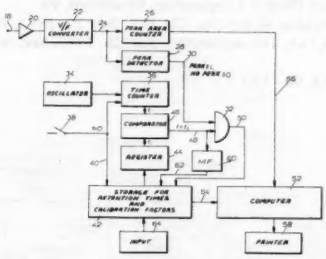
Dietrich A. H. Boege, Santisblick 18, Daisendorf, 7758, Germany

Filed Sept. 17, 1973, Ser. No. 397,907

Claims priority, application Germany, Sept. 19, 1972, 2245815

Int. Cl. G01n *31/08*

U.S. Cl. 73—23.1 **6 Claims**



1. In a method for identifying and forming useful data from peaks in chromatograms, in which the peaks are integrated to form a peak area, the peaks are identified by means of their retention times and the peak areas are multiplied by stored detector sensitivity calibration factors, the improvement comprising the following method steps:
a. storing predetermined nominal retention times and associated detector sensitivity calibration factors;
b. interrogating the chromatogram of a sample under test at the nominal expected retention times to detect the existance of a peak; and
c. multiplying the area of a peak detected at the instant of such interrogation by the calibration factor associated with the corresponding nominal retention time to form a product proportional to the amount of sample component causing the particular peak detected.

3,898,838

ULTRASONIC SCANNING SYSTEM

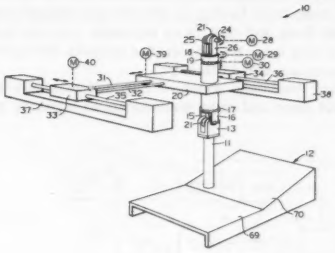
John J. Connelly, Chicago, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Nov. 1, 1973, Ser. No. 411,942

Int. Cl.² G01N *29/04*

U.S. Cl. 73—67.8 S **14 Claims**

1. In an ultrasonic testing system including transducer means for periodically transmitting bursts of ultrasonic energy toward a front surface of a part and for developing a test signal including a front surface signal from reflection from said front surface and additional signals from reflections from inhomogeneities within the part, scanning means including reversible electric motor means for adjusting the angular position of said transducer means about a predetermined axis, means for supplying a clock signal in synchronized relation to the transmission of a burst from said transducer means, and angular adjustment means responsive to said front surface signal for controlling said reversible electric motor means to rotate said transducer means about a predetermined axis to increase the amplitude of said front surface signal toward a maximum value, said angular adjustment means comprising gating



means, means responsive to said clock signal for operating said gating means for a time interval starting at a time before said front surface signal and ending at a time after said front surface signal, and means for applying said test signal to said gating means.

3,898,839

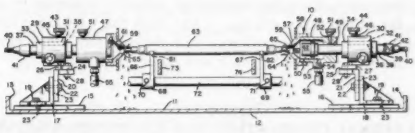
ULTRASONIC TESTING SYSTEM FOR A TEST PIECE

Allwyn M. White, Danbury, Conn., assignor to Automation Industries, Inc., Los Angeles, Calif.

Filed Nov. 8, 1973, Ser. No. 413,939

Int. Cl.² G01N *29/00*

U.S. Cl. 73—67.8 R **6 Claims**



1. An ultrasonic testing system for nondestructive testing a plurality of test pieces having an elongated body for flaws or the like, said system comprising
at least one nozzle associated with said system having a cavity therein and an orifice in fluid communication with said cavity,
a source of liquid couplant in fluid communication with the interior of said cavity for supplying a liquid couplant under pressure in said nozzle,
transducer means fixed disposed in said cavity and in fluid engagement with said liquid couplant for directing a pulse out of said orifice,
aligning means associated with said system for aligning said test piece in a manner receiving both said pulse and said liquid couplant thereagainst, and
transporting means associated with said system for selectively transporting each of said test pieces into alignment with said aligning means.

3,898,840

MULTI-FREQUENCY ULTRASONIC SEARCH UNIT

Jerry T. McElroy, Danbury, Conn., assignor to Automation Industries, Inc., Los Angeles, Calif.

Filed Jan. 30, 1974, Ser. No. 437,793

Int. Cl.² G01N *29/04*

U.S. Cl. 73—67.9 **11 Claims**

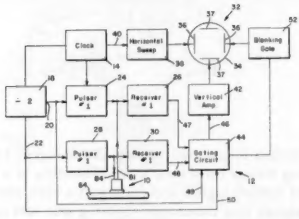
1. In a nondestructive testing system for inspecting a workpiece with a dual transducer search unit in which a first frequency electrical channel is connected to one of the search

unit transducers and a second frequency electrical channel is connected to the other search unit transducer for respective transmission and/or reception of ultrasonic energy at different frequencies, said search unit including:

an inner transducer having a piezoelectric disc element with front and rear faces and electrode means affixed thereto;

an outer transducer having an annular piezoelectric element with front and rear faces mounted coaxially with respect to said inner transducer disc element and having electrode means affixed thereto;

an acoustical insulating structure disposed coaxially between said inner and outer transducers to minimize the



transfer of acoustical energy radially between said transducers; and

inner and outer acoustical transmitting means coupled to the front faces of said transducer elements for transmitting ultrasonic energy between said transducers and a forward working portion of said search unit, at least one of said inner and outer transmitting means including acoustical modifying means for differentially modifying acoustical waves associated with one of said transducers relative to the other transducer, whereby optimum transfer of ultrasonic energy to and from the workpiece may be achieved in accordance with the different frequencies associated with the inner and outer transducers.

3,898,841

EXTERNAL COMBUSTION HOT GAS PISTON ENGINE

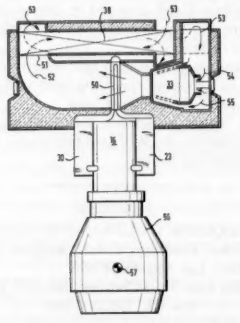
Hans-Joachim Kanzler, Viernheim, and Gunter Reuchlein, Gersthofen, both of Germany, assignors to Maschinenfabrik Augsburg-Nurnburg Aktiengesellschaft, Augsburg and Motoren-Werke Mannheim AG vorm. Benz Abt. stat. Motorenbau, Mannheim, both of, Germany

Filed Apr. 15, 1974, Ser. No. 460,754

Claims priority, application Germany, Apr. 30, 1973, 2321872

Int. Cl. F02g *1/06*

U.S. Cl. 60—525 **11 Claims**



1. In a hot gas piston engine with at least one casing unit comprising a hot working chamber and a cold working chamber, in which each hot working chamber is connected through a heater, a regenerator and a cooler with a cold working chamber, and in which at least a section of each heater is provided with a combustion chamber, for generating energy, which then is provided with a preheater for its combustion-supporting air;

the improvement comprising:

a plurality of combustion chambers (**5, 11; 33 to 36; 72 to 75**);

an air preheater located ahead of each combustion chamber in the air supply thereof (**8, 9; 37 to 40; 76 to 79**), each said air preheater being supplied with heat from the combustion products of a combustion chamber other than the combustion chamber to which said preheater delivers preheated air (**5, 11; 33 to 36; 72 to 75**).

3,898,842

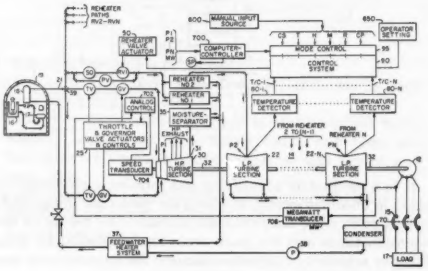
ELECTRIC POWER PLANT SYSTEM AND METHOD FOR OPERATING A STEAM TURBINE ESPECIALLY OF THE NUCLEAR TYPE WITH ELECTRONIC REHEAT CONTROL OF A CYCLE STEAM REHEATER

Michael C. Luongo, Brookhaven, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 221,185, Jan. 27, 1972, Pat. No. 3,182,113. This application Jan. 29, 1973, Ser. No. 327,519

Int. Cl. F01k *7/04*

U.S. Cl. 60—653 **14 Claims**



1. An electric power plant comprising,

a source of steam,

a condensing means,

a steam turbine, said steam turbine at least including a high pressure element having a cycle steam inlet connected to the source of steam and a cycle steam exhaust, and a lower pressure element having a cycle steam inlet and a cycle steam exhaust to discharge cycle steam to the condensing means, said high and lower pressure elements being operatively connected to rotate an electric generator.

an electric generator rotatable by the steam turbine,

reheating means, said reheating means including a first steam passage portion connected to conduct turbine cycle steam from the exhaust of the high pressure turbine element to the inlet of the lower pressure turbine element, said reheating means having a second steam passage portion connected to conduct heating steam from the steam source through the reheating means in heat transfer relation with the first steam passage portion,

valve means connected to govern the rate of flow of heating steam through the reheating means,

temperature detecting means connected to detect a temperature in the lower pressure turbine element at a location where the detected temperature varies with the temperature of the reheated cycle steam entering said lower pressure turbine element,

means to generate a signal representative of a predetermined reference temperature, and

control means responsive to the reference temperature signal and to the detected temperature detected by the detecting means to control the valve means to vary the rate of flow of heating steam to reduce the difference between the detected temperature and the reference temperature.

3,898,843

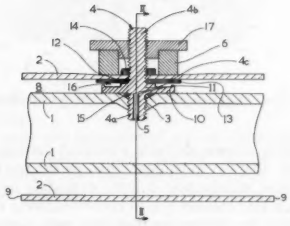
ON-OFF FLOW CONTROL DEVICE AND IRRIGATION SYSTEM INCORPORATING SAME

William Waterston, Dunedin, New Zealand, assignor to G. Methven & Co., Limited, South Dunedin, New Zealand

Filed May 22, 1973, Ser. No. 362,764

Int. Cl. E02b *13/00;* **F16k** *51/00*

U.S. Cl. 61—13 **12 Claims**



1. A variable opening and closing flow control device for an underground fluid supply line which includes means defining an outlet aperture in said line; an elongate member, one end portion of said elongate member being inserted through said outlet aperture into said supply line, the other end portion of said elongate member extending outwardly of said supply line; a moisture sensitive element positioned about said outer end portion of said elongate member; said moisture sensitive element being composed of a moisture absorbing material having the property of swelling as it absorbs moisture and contracting as it dries; a flexible fluid barrier member positioned between said aperture and said element; adjustable means engaging the outer end portion of said moisture sensitive element to hold said element in contact with the fluid barrier member; flange means provided on said elongate member intermediate the end portions thereof and positioned between the fluid supply line and fluid barrier member; means on said flange means defining a recess therewith; a bore provided in said elongate member communicating between the interior of the supply line and said recess; shoulder means provided on said elongate member intermediate the end portions thereof, a flexible washer means engageable about said elongate member between said shoulder means and the flexible fluid barrier member; adjustable nut means provided on said elongate member adjacent the outer surface of said flexible fluid barrier member, adjustable to tighten against said barrier member to form a seal therewith about said elongate member; and sealing means provided about said elongate member adjacent said outlet aperture in the supply line; whereby the gradual swelling and contraction of said moisture sensitive element is arranged to apply pressure onto the flexible fluid barrier member and said washer means and gradually close off and open respectively said recess to control said flow passage of fluid in dependence upon the moisture content of the underground medium surrounding the device.

3,898,844

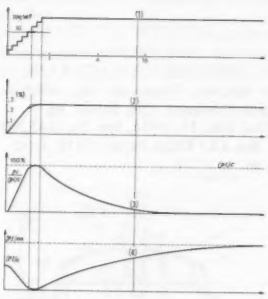
METHOD OF COMPACTING MADE-UP GROUND AND NATURAL SOIL OF MEDIOCRE QUALITY

Louis Menard, 54 Ave. de la Motte-Picquet, Paris, France

Continuation-in-part of Ser. No. 183,397, Sept. 24, 1971, abandoned. This application May 21, 1973, Ser. No. 362,147

Int. Cl.[2] E02D *3/04*

U.S. Cl. 61—35 **7 Claims**



1. A method of consolidating damp unfluidized soil, said method comprising the steps of: applying a dynamic load to the soil until the voids in the soil are reduced to bring the soil to fluidization; discontinuing the application of the dynamic load after the soil has been compacted to fluidization; and allowing the water to drain from the soil, during a rest phase.

3,898,845

MINERAL MINING INSTALLATIONS

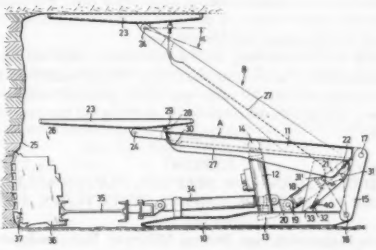
Lubomir Plevak, Lunen; Kunibert Bekcer, Werl; Egon Wojaczek, Bockum-Hovel, and Norbert Holken, Altlunen, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westphalia, Germany

Filed Jan. 30, 1974, Ser. No. 438,044

Claims priority, application Germany, Jan. 31, 1973, 2304528; Mar. 24, 1973, 2314834

Int. Cl.[2] E21D *15/44*

U.S. Cl. 61—45 D **11 Claims**



1. A mineral mining installation comprising a member which, during use of the installation, engages on the floor of a mine working near a mineral face; a shield, a roof girder carried by said shield, said roof girder being pivotably supported on the shield so as to pivot about an axis extending generally parallel to the mineral face, the girder being disposed such that the end nearest the mineral face tends to tilt downwardly under the influence of gravity; traction means which acts on the roof girder to compensate for said tendency and serves to maintain the girder in a position substantially parallel to the floor-engaging member, said traction means comprising a cable which is secured to a rear portion of the roof girder and to the floor-engaging member, the cable being

guided by guide means along the shield, a support linkage, means for pivotably connecting the linkage to the shield and to the floor-engaging member, at least one hydraulically operated telescopic prop disposed between the shield and the floor-engaging member and operable, during use of the installation, to bring the roof girder into contact with the roof of the mine working and shifting means for swinging the linkage in relation to the floor-engaging member to effect movement of the shield and the roof girder towards or away from the floor of the mine.

3,898,846

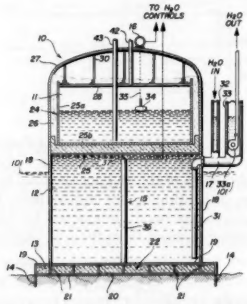
OFFSHORE STORAGE TANK

John Stanton McCabe, Naperville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Feb. 19, 1974, Ser. No. 443,341

Int. Cl.[2] E02B *29/06*; **F17C** *1/00*

U.S. Cl. 61—46 **13 Claims**



1. An offshore tank for storage of a liquid comprising:
a vertical shell, a bottom joined to a lower portion of the shell, and a roof supported by the vertical shell;
a partition fixed in place inside of the shell dividing it into an upper receptacle suitable for storage of liquid and a lower fluid receptacle, said partition barring fluid flow to and from the lower and upper receptacles and providing vertical support for liquid stored in the upper receptacle; said lower receptacle being filled with fluid maintained therein under sufficient pressure to thereby provide support for the upper receptacle; and
sensing and monitoring means associated with the upper receptacle to sense the deflection of said partition and including means to raise the fluid pressure inside the lower receptacle in response to loading on the partition.

3,898,847

FIXED PLATFORM FOR DEEP SEA DEPTHS ABLE TO HOUSE PLANTS, EQUIPMENTS STRUCTURES, MEN AND MEANS

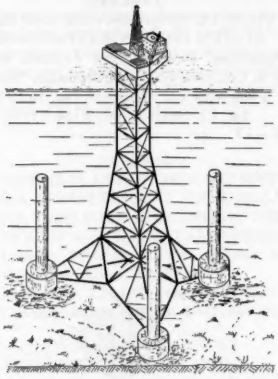
Umberto Magnanini, San Donato Milanese, Italy, assignor to Tecnomare S.p.A., San Donato Milanese, Italy

Continuation of Ser. No. 270,733, July 11, 1972, abandoned. This application May 22, 1974, Ser. No. 472,234

Int. Cl.[2] E02B *17/00*

U.S. Cl. 61—46.5 **3 Claims**

1. A floatable deep sea platform comprising:
a horizontal bridge member adapted to provide a working area above the surface of the sea;
a rigid support structure attached to and extending downwardly from said bridge member, said structure including a first substructure directly below said bridge member, said substructure being triangular in horizontal cross-section and having a constant cross-sectional area,
a second substructure attached to and extending downwardly from said first substructure, said second substructure being triangular in horizontal cross-section and having a cross-sectional area which increases at increasing distance from said bridge member, and
a base section composed of three outwardly extending opposed pyramidal members attached at their bases to said second substructure;
support means attached at the outer end of each pyramidal member, each said support means including



a hollow caisson defining a support surface at its lower end, adapted to be positioned on the sea bed, and
a hollow stabilization column extending upwardly from each said caisson and in communication therewith;
and means for delivering fluid into said caissons and said stabilization columns to control the buoyancy of the platform, whereby said platform may be floated in an upright orientation for movement at sea and lowered vertically onto the sea bed.

3,898,848

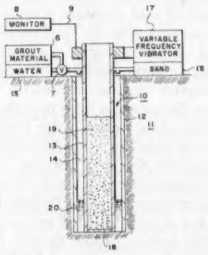
METHOD OF GROUTING A PILE IN A HOLE INVOLVING THE OPTIMIZED FREQUENCY OF VIBRATION OF THE GROUTING MATERIAL

Reece E. Wyant, Houston, Tex.

Filed Mar. 28, 1974, Ser. No. 455,754

Int. Cl. E02d *5/00*, *3/02*

U.S. Cl. 61—53.52 **10 Claims**



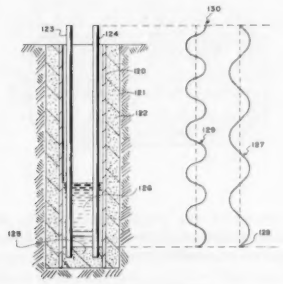
1. A method of grouting a pile in a hole, comprising:
placing a pile of a given external diameter in a hole having a diameter larger than said external diameter;
adding a wet grouting material to said hole within the annulus external to said pile;
vibrating said grouting material; and
varying the frequency of said vibration to reinforce the amplitude of said vibration.

3,898,849

METHOD OF PACKING HEAT PIPES WITHIN A PIPE PILE INVOLVING THE OPTIMIZED FREQUENCY OF VIBRATION OF THE PACKING MATERIAL

Reece E. Wyant, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 12, 1974, Ser. No. 496,411
Int. Cl.[2] E02D 5/00, 3/06; F28D 9/00
U.S. Cl. 61—53.52 5 Claims



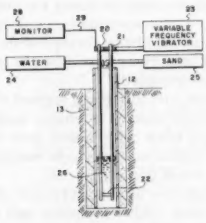
1. A method of packing at least one heat pipe within a pipe pile, comprising:
placing at least one heat pipe of a given external diameter within the interior of said pipe pile having an internal diameter larger than said external diameter;
adding a wet grouting material to the interior of said pipe pile;
vibrating said grouting material; and
varying the frequency of said vibration to reinforce the amplitude of said vibration.

3,898,850

METHOD OF PACKING HEAT PIPES WITHIN A PIPE PILE INVOLVING THE OPTIMIZED VIBRATION OF THE PACKING MATERIAL

Reece E. Wyant, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 9, 1974, Ser. No. 496,221
Int. Cl. E02d 5/00, 3/02
U.S. Cl. 61—53.52 7 Claims



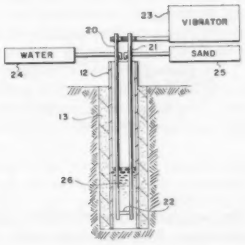
1. A method of packing at least one heat pipe within a pipe pile, comprising:
placing at least one heat pipe within the interior of said pipe pile;
metering a predetermined amount of water into the interior of said pipe pile;
placing sand in said water to form a sand and water mixture after said water is in place in the bottom of said pipe pile;
vibrating said sand and water mixture, said mixture having enough water to remain fluidized during said vibration; and
varying the frequency of said vibration to reinforce the amplitude of said vibration.

3,898,851

METHOD OF PACKING HEAT PIPES WITHIN A PIPE PILE INVOLVING THE VIBRATION OF THE PACKING MATERIAL

Reece E. Wyant, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 12, 1974, Ser. No. 496,412The portion of the term of this patent subsequent to Oct. 8, 1991, has been disclaimed.
Int. Cl.[2] E02D 5/00, 3/06; F28D 9/00
U.S. Cl. 61—53.52 7 Claims



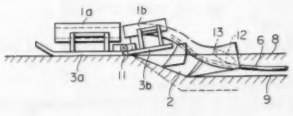
1. A method of packing at least one heat pipe within a pipe pile, comprising:
placing at least one heat pipe within the interior of said pipe pile;
metering a predetermined amount of water into the interior of said pipe pile;
placing sand in said water to form a sand and water mixture after said water is in place in the bottom of said pipe pile; and
vibrating said sand and water mixture, said mixture having enough water to remain fluidized during said vibration.

3,898,852

DITCHING MACHINES FOR SUBMARINE CABLE

Takuji Ezoe, and Kikuo Shirai, both of Tokyo, Japan, assignors to Kokusai Cable Ship Co., Ltd., Tokyo, Japan

Filed June 7, 1973, Ser. No. 367,889
Claims priority, application Japan, June 7, 1972, 47-056103
Int. Cl.[2] E02F 5/02; F16L 1/00
U.S. Cl. 61—72.4 4 Claims



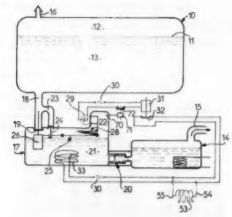
1. A ditching machine comprising a main body having front and rear portions, a cutting bit mounted on said rear portion, stabilizing means mounted on the sides of the front and rear portions of said main body, and pivotal joint means having a horizontal axis for joining the rear of the front portion and the front of the rear portion of said main body, such that said rear portion moves with respect to said front portion only about the horizontal axis of the pivotal joint means.

3,898,853

METHOD AND DEVICE FOR SUPPLYING GAS UNDER PRESSURE FROM A STORAGE TANK CONTAINING THE SAID GAS IN LIQUEFIED STATE

Jacques Iung, Pontarlier, France, assignor to Gurtner, S.A., France

Filed May 29, 1973, Ser. No. 364,739
Claims priority, application France, June 1, 1972, 72.19733; Mar. 5, 1973, 73.07756
Int. Cl. F17c *17/02*
U.S. Cl. 62—55 **16 Claims**



1. Method for supplying a combustible liquid, such as, liquefied petroleumgas, from a storage tank filled at least partially with said liquid to a point of distribution of the gas under pressure, the said method comprising the steps of: allowing the liquid contained in the tank to flow by gravity into a container lower than said tank and of a comparatively very reduced capacity as compared to said tank, while at the same time preventing the return of the liquid from the container towards the tank; providing for the liquid contained in the container a path of flow from the said container towards the said point of distribution and withdrawing from said point of distribution as required gas derived from the liquid reaching said point of distribution from said container; increasing the pressure in said container when the liquid therein rises to a given upper level; to expel the liquid therefrom towards the point of distribution, by effecting a partial gasification of the liquid in the said container; and, when the liquid level in said container lowers below a given lower level, withdrawing the gaseous phase contained in the said container to permit further introduction of liquid into the said container from said tank.

3,898,854

METHOD OF PROCESSING, TRANSPORTING AND STORING MEAT

Richard Y. McSheehy, Houston, Tex., and Harold G. Jones, Huntsville, Ala., assignors to Ecodyn Systems, Inc., Houston, Tex.

Filed Feb. 1, 1974, Ser. No. 438,746
Int. Cl. F25d *25/02*
U.S. Cl. 62—62 **6 Claims**

1. A method of processing, transporting and storing meat comprising the steps of:

a. cutting and packaging meat;

b. placing packaged meat in portable sealingly encloseable locker units having heat exchangers therein;

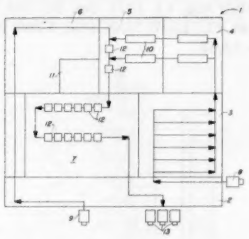
c. reducing the temperature of said packaged meat within said locker units to temperatures between 30°F and 40°F;

d. transporting said packaged meat and locker units to a point of distribution;

e. connecting said locker unit heat exchangers to a refrigerant system, including a refrigerant compressor, located at said point of distribution; and

f. maintaining said packaged meat and the interior of said locker units at temperatures between **30°F** and **40°F**;

g. said cutting, packaging and transporting of said meat being completely conducted in a substantially bacteria



free environment of no more than 100,000 particulates, 0.5 microns or smaller, per cubic foot.

3,898,855

ICE RINK MOULD AND METHOD OF CONSTRUCTING AN ICE RINK UTILIZING THE MOULD

Charles P. Curfhey, 1405-40 Driveway N., Ottawa, Canada (K2P 1C9)

Filed Oct. 3, 1973, Ser. No. 403,082
Int. Cl.² F25C *3/02*
U.S. Cl. 62—75 **7 Claims**

1. A plastic mold for use in constructing an outdoor natural ice skating rink on a ground surface, comprising:

a. a plurality of juxtaposed discrete cells defining a bottom surface, and an inner wall structure;

b. an outer wall structure enclosing the inner wall structure to form therewith a watertight container;

c. said bottom surface being formed of flexible thin plastic material that conforms generally to the ground surface on which it is to be placed;

d. said inner wall structure being formed of plastic material having sufficient rigidity to enable said cells to remain upright when filled with water, and having sufficient flexibility to enable said cells to be wound into a roll when the mold is not in use;

e. said outer wall structure being formed of plastic material having sufficient rigidity to enable said outer wall structure to stand upright;

f. whereby when the interior of the mold is flooded with water to fill said cells to substantially their tops and the water in said cells is frozen, a basic ice surface is formed while reducing the formation of shell ice and the flow of water from high ground to low ground surface levels, leaving only the tops of said inner wall structure bare of ice; and

g. whereby further floodings and freezings of the interior of the mold will produce a skatable ice surface over said cells.

h. said mold being sufficiently large to permit a human being to ice skate thereon.

3,898,856

WATER CHILLING METHOD AND APPARATUS

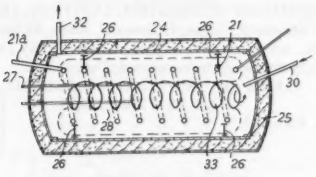
Mieczyslaw Komedera, Orpington, England, assignor to MK Refrigeration Ltd., Kent, England

Filed Sept. 24, 1973, Ser. No. 400,118

Claims priority, application United Kingdom, Oct. 6, 1972, 46352/72

Int. Cl. B67d 5/62

U.S. Cl. 62—98 7 Claims



1. Chilling apparatus for chilling a flow of water comprising a tank for containing water, refrigeration means including a helical refrigerant evaporator coil disposed within the tank in spaced relation to the internal surface of the tank for forming a tube of ice in the tank, a water inlet means and a water outlet means in the tank, the water inlet means directing a flow of water from the inlet means in a helical path through the tube of ice and in direct contact with the ice thereby to chill the water, and a sensor disposed within the offset from the axis of the tube and coupled to said refrigeration means, said sensor being operative to stop operation of the refrigeration means in the event that the sensor detects ice in its immediate vicinity, and said sensor being disposed radially outwardly of the water inlet.

3,898,857

PROCESS FOR REGULATING THE QUANTITY OF COLD DELIVERED BY A REFRIGERATING INSTALLATION

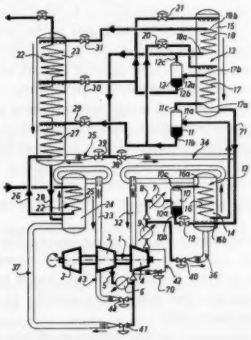
Jean Bourguet, Les Vesinet, and Joseph Gauberthier, Paris, both of France, assignors to Teal, Societe des Procedes L'Air Liquide et Technip de Liquefaction des Gaz Naturels, Rueil-Malmaison, France

Filed Sept. 20, 1973, Ser. No. 399,279

Claims priority, application France, Sept. 22, 1972, 72.33672

Int. Cl.[2] F25B 5/00

U.S. Cl. 62—117 16 Claims



1. In a process for regulating the frigorific power delivered by a refrigeration installation operating an incorporated cascade cycle wherein

a. at least one cycle mixture is compressed in gaseous form from a lower pressure to a higher pressure, in at least one compression stage,

b. the resulting compressed cycle mixture is partially condensed, by heat exchange with an external refrigerant, and a first liquid fraction (A) is separated therefrom.

c. progressive condensation of at least the residual gaseous cycle mixture is affected at said higher pressure by heat exchange with, and while flowing counter-currently with respect to, a diphasic refrigerating stream comprised of at least a part of said cycle mixture, which stream is undergoing vaporization at a vaporization pressure at least equal to said lower pressure, whereby at least a last liquid fraction is obtained from the residual cycle mixture,

d. at least a part of each of the liquid fractions of said cycle mixture is expanded from said higher pressure to said vaporization pressure, and the expanded liquids thus obtained are combined into said refrigerating stream, and

e. at least said vaporized refrigerating stream formed in (d) and constituting at least a part of said cycle mixture is recompressed in gaseous form to said higher pressure.

the improvement which comprises

i. withdrawing at least a first gaseous recycle stream from said cycle mixture in gaseous form, under a pressure at most equal to said higher pressure and above said lower pressure,

ii. expanding to said vaporization pressure at least a gaseous portion of said withdrawn gaseous stream,

iii. combining said gaseous expanded portion with said refrigerating stream, before or when said at least a part of liquid fraction (A), after having been expanded to said vaporization pressure, is combined with said refrigerating stream,

iv. recompressing in gaseous form said combined portion formed in (iii) together with said refrigerating stream, when the latter has been vaporized, and

v. controlling the flow-rate of said expanded gaseous portion of said first recycle stream.

3,898,858

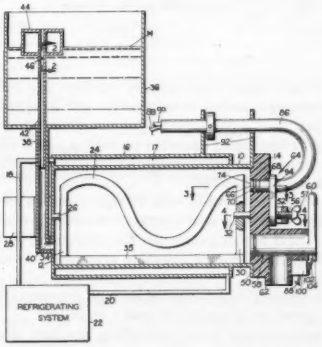
SOFT ICE CREAM MACHINE

V. Robert Erickson, 8015 S.W. Oleson Rd., Portland, Oreg. 97223

Filed Sept. 14, 1973, Ser. No. 397,447

Int. Cl. F25c 7/10

U.S. Cl. 62—135 8 Claims



1. An ice cream machine of the continuous dispensing type for making and dispensing soft ice cream comprising

a. a freezing barrel having opposite ends and enclosing side walls with an interior surface defining a freezing and mixing chamber,

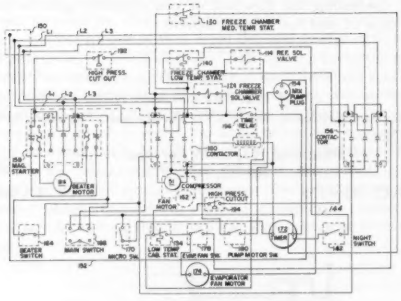
b. an inlet adjacent one end of said freezing barrel for admitting mix into said chamber,
c. an outlet valve adjacent the other end of said freezing barrel for discharging ice cream,
d. means in said chamber for mixing said ice cream and forcing it from said outlet valve,
e. a cooling chamber surrounding at least a portion of said freezing barrel,
f. refrigerating means associated with said cooling chamber for cooling the freezing barrel,
g. thermostat means controlling the operation of said refrigerating means to cause operation of the latter at a selected sensing temperature,
h. temperature sensing means for said thermostat means,
i. and insulated support means supporting said temperature sensing means on said freezing barrel adjacent said other end in isolated relation from the temperature influence of the enclosing walls of said freezing chamber and said cooling chamber,
j. said sensing means comprising a head portion of heat conductive material,
k. said head portion being supported such that an end surface thereof is exposed interiorly to the freezing and mixing chamber for directly sensing the temperature of the ice cream adjacent the outlet.

3,898,859

APPARATUS AND METHOD FOR THE PREPARATION OF SOFT SERVE PRODUCTS

Gene S. Duke, Moline, Ill., assignor to H. C. Duke & Son, Inc., East Moline, Ill.

Filed Feb. 13, 1974, Ser. No. 442,219
Int. Cl.[2] F25D *29/00*; **A23F** *9/02*
U.S. Cl. 62—135 **7 Claims**



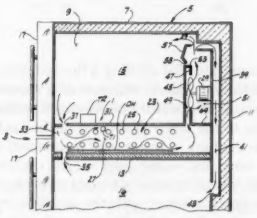
1. A soft serve confectionary machine comprising:
a freezing chamber in association with a refrigeration chamber;
said refrigeration chamber providing space for at least one container of mix composition to be processed in said freezing chamber;
pump means within said refrigeration chamber and connectable with said container to convey mix composition to said freezing chamber for processing and dispensing;
refrigeration means operably connected to said chambers including;
compressor means having its high pressure discharge connected to a condenser and a receiver;
a main control valve controlling liquified refrigerant from said receiver;
a first branch conduit connected to a refrigeration coil in said freezing chamber;
a return conduit connected to the intake of said compressor means;
thermostatic control means for said branch conduit operable to maintain said freezing chamber at freezing temperature in one mode of operation and at refrigeration temperature in a second mode of operation;
a second branch line connected to a refrigeration coil in said refrigeration chamber;
a return conduit connected from said refrigeration coil to the said intake of said compressor; and
independent thermostatic control means to maintain said refrigeration chamber at a refrigeration temperature.

3,898,860

AUTOMATIC DEFROSTING CONTROL SYSTEM

Glen C. Shepherd, Garland; James B. Allen, Richardson, both of Tex., and Samuel T. Bryant, Louisville, Ky., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 15, 1974, Ser. No. 514,347
Int. Cl. F25d *21/06*
U.S. Cl. 62—155 **5 Claims**



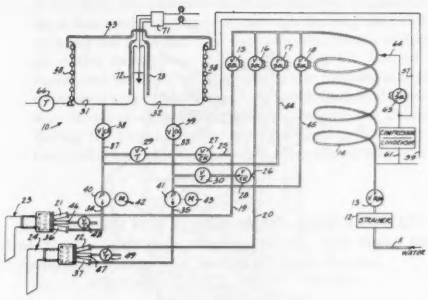
1. An automatic defrosting control system for a refrigeration system having cooling means for absorbing heat from a zone to be cooled and thermostatic means for periodically energizing the cooling means to maintain the zone substantially at a preselected temperature, said cooling means being subject to the accretion of frost thereon which thereby increases the periods of energization of the cooling means in order to maintain the zone at the preselected temperature, said control system comprising:
means for causing defrosting of said cooling means;
a thermostat adapted to be positioned in heat-exchange relation with both said cooling means and said defrosting means and adapted for connection in a control circuit, said thermostat having a first switching position for terminating energization of said defrosting means and a second switching position for enabling operation thereof, said thermostat switching from its first to its second position in response to its temperature falling to a lower predetermined level and switching to its first position in response to its temperature rising to a higher predetermined level;
a thermal time-delay adapted to be positioned in heat-exchange relation with said cooling means and adapted for connection in said control circuit, said relay having a first switching position for permitting operation of said cooling means and a second switching position for energizing said defrosting means and preventing operation of said cooling means, said relay switching from its first position to its second position upon reaching a given temperature and switching from its second to its first position upon reaching a different preselected temperature;
said thermostatic means being responsive to the temperature in said zone to periodically energize said cooling means to cycle between an "on" mode and an "off" mode to maintain the zone substantially at said preselected temperature; and
means responsive to the duration of one of said modes to supply heat to said relay whereby upon a sufficient accretion of frost forming on the cooling means the increased duration of the "on" mode will cause the temperature of the relay to reach its given temperature and switch to its second position and will cool said thermostat to cause its

temperature to fall below its lower predetermined level and switch to its second position thereby energizing said defrosting means.

3,898,861
BEVERAGE DISPENSER

John R. McMillin, St. Paul, Minn., assignor to The Cornelius Company, Anoka, Minn.

Filed Aug. 20, 1973, Ser. No. 389,808
Int. Cl. F25d *17/00*
U.S. Cl. 62—177 **37 Claims**



1. A beverage mixing and dispensing system comprising:

a. a source of flavored beverage ingredient of the liquid concentrate type;

b. a mixing and dispensing spout;

c. a line connecting concentrate source to said spout;

d. a selectively actuatable control member in said concentrate line for controlling flow of the beverage ingredient through said spout;

e. a normally closed main valve for being connected to a supply of pressurized water and connected to said spout independently of said concentrate line so that the beverage ingredient is mixed with diluting water within said spout when said main valve and said control member are actuated; and

f. a normally closed flushing valve for being connected to the same supply of water and connected to said concentrate line upstream of said control member, said flushing valve being sized to have a flow rate capacity which is greater than the flow rate capacity of said control member,

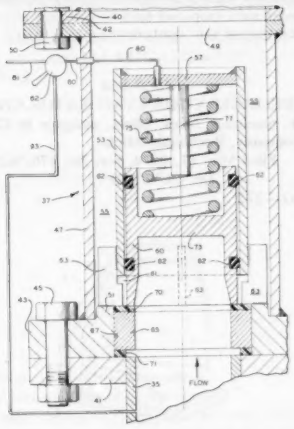
whereby beverage is mixed and dispensed when said control member and said main valve are jointly actuated, and whereby at least a portion of said concentrate line, said control member and said spout are flushed when said control member and said flushing valve are jointly actuated.

3,898,862
ECONOMIZER PRESSURE REGULATING SYSTEM

Hans Gerhard Kerschbaumer, and James W. Endress, both of Syracuse, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 381,811, July 23, 1973, Pat. No. 3,827,250. This application May 6, 1974, Ser. No. 467,415
Int. Cl. F25b *41/04*
U.S. Cl. 62—197 **4 Claims**

1. An economizer pressure regulating system for regulating the pressure in the economizer connected in a refrigerant passage extending from a condenser to a cooler, said regulator comprising a casing connected in a line extending from the economizer to a compressor and forming a portion of said line, a cylinder fixedly mounted in said casing, said cylinder extending in a direction lengthwise of the casing in spaced relation thereto, and forming, in conjunction therewith, a flow passage extending through said casing, said cylinder being formed with an open end confronting the flow of fluid from said economizer, the opposite end of said cylinder being provided with a closure, a port adjacent the open end of the cylinder and serving to pass the flow from the economizer into said flow passage, a piston valve mounted in said cylinder and being movable into and out of position to open and close said port, the application of pressure in the flow from said economizer urging said piston valve to a port opening position, a

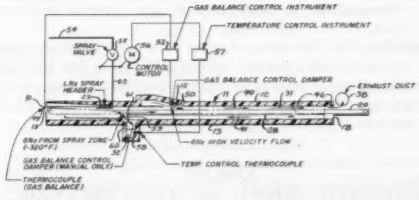


spring acting on the opposite side of the valve and yieldingly urging the same to a port closing position, a control line extending from the cooler to the area between the opposite side of said valve and said cylinder closure, whereby the piston valve is moved to port opening position upon the pressure within the economizer exceeding the pressure within said cooler.

3,898,863
CRYOGENIC REFRIGERATION APPARATUS WITH AUTOMATIC TEMPERATURE CONTROL AND AUTOMATIC GAS BALANCE CONTROL

Richard C. Wagner, Darien, Ill., assignor to Hollymatic Corporation, Park Forest, Ill.

Continuation-in-part of Ser. Nos. 264,133, June 19, 1972, Pat. No. 3,824,806, and Ser. No. 390,755, Aug. 23, 1973, Pat. No. 3,871,186. This application Dec. 14, 1973, Ser. No. 424,768
Int. Cl. F25b *41/06*
U.S. Cl. 62—208 **16 Claims**



1. Apparatus for refrigerating articles, comprising: means defining a thermally isolated chamber having boundary walls and an entrance and an exit for passage of said articles through said chamber; conveyor means in said chamber for said passage; introducing means for introducing a cryogen means into said chamber for providing cryogen gas in said chamber; circulating means for circulating said gas in a circulation loop including a first reach in direct heat exchange contact with said articles and a second reach out of said direct contact with said articles; gas outlet exhaust means from said chamber spaced from said loop on the side thereof adjacent

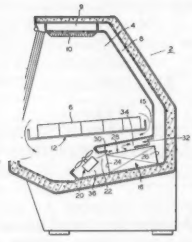
said chamber entrance; flow restriction means in said chamber between said loop and said exhaust for limiting volumetric gas flow from said loop to said exhaust and thereby maintaining a rapid gas flow rate in said loop; gas outlet vent means from said chamber located adjacent to said chamber exit; temperature responsive control means for automatically controlling the rate of said introducing of cryogen as a function of gas temperature in said loop; and temperature responsive gas balance control means for automatically proportioning gas flow between said loop and said vent means as a function of gas temperature at said vent means.

3,898,864

REFRIGERATION EVAPORATOR COIL

Melvin W. Steelman, Niles, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed May 17, 1974, Ser. No. 470,762
Int. Cl.[2] F25D *21/00*
U.S. Cl. 62—272 **6 Claims**



1. Air refrigeration apparatus including:
an air conducting conduit,
an air propulsion means capable of circulating air through said conduit,
an air cooling means located in said conduit having a first air inlet area, a second air inlet area and an air outlet area,
said first inlet area being located in a plane normal to the direction of air flow through said conduit,
said second air inlet area being located in a plane normal to said first inlet area,
restriction means between said first and second air inlet areas,
a plenum chamber lying between said restriction means and said second air inlet area,
whereby in the absence of frosting conditions, the major volume of the air flows through said first inlet area and when,
said first inlet becomes clogged with frost the restriction means permits a greater volume of the air to flow through said second inlet area to said cooling element to thereby, provide for entry of air into said cooling element when the first inlet area becomes clogged with frost.

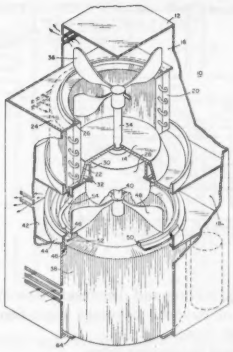
3,898,865

CONDENSATE DISPOSAL APPARATUS FOR AN AIR CONDITIONER

Richard F. Stewart, West Jefferson, and Francis A. Gasparini, Columbus, both of Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 30, 1974, Ser. No. 465,636
Int. Cl. F25b *47/00*
U.S. Cl. 62—280 **10 Claims**

1. An improved air conditioning unit including a housing having a first compartment enclosing a condenser and a second compartment enclosing an evaporator, said second compartment being disposed generally above said first compartment and including means for collecting condensate from said evaporator, a motor for rotating a shaft coupled to fan means disposed within said first compartment for moving air from one side of said condenser to the other side and wherein the improvement comprises means for depositing said collected condensate on said one side of said condenser including:
said condenser having a cylindrical configuration and disposed within said first compartment on a vertical axis generally common to the axis of rotation of said fan means;
means for draining said collected condensate, said drain means leading from said collecting means into said first compartment;



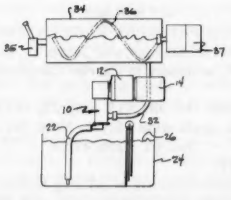
means drivingly coupled to said shaft and fan means within said first compartment for receiving said condensate from said drain means and centrifugally expelling said condensate therefrom as said shaft rotates; and,
means in the normal path of said centrifugally expelled condensate to intercept said condensate for deposition on the surface of said one side of said condenser whereupon, due to the airflow through said condenser said condensate is generally moved towards said other side of said condenser as it flows downwardly to traverse said condenser for vaporization therefrom.

3,898,866

SINGLE-STAGE PROPORTIONING PUMP

Richard M. Keyes, Rockford, and Bertel S. Nelson, Naperville, both of Ill., assignors to Beatrice Foods Co., Chicago, Ill.

Filed Sept. 9, 1974, Ser. No. 504,526
Int. Cl. B01f *3/04*
U.S. Cl. 62—306 **12 Claims**



7. In a machine for dispensing an aerated semifrozen comestible, the machine having a reservoir for holding a liquid comestible to be pumped, a single-stage proportioning pump which pumps air and liquid simultaneously, a motor for driving the pump, a freezing compartment for receiving the liquid comestible and air, and means in the freezing compartment for scraping the frozen comestible off the surface thereof and

for entraining the air in the comestible; characterized by the pump including:

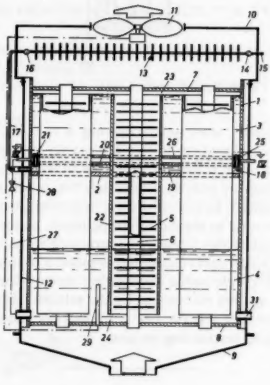
a hollow upright cylinder having top and bottom ends; a plug at the bottom of the cylinder; a reciprocable piston in the cylinder above the plug and therewith defining an expansible and contractable chamber; the cylinder having a side opening therethrough adjacent the piston; the piston having a socket at said opening; drive means between the motor and pump and including an arm extending through said opening and a ball in said socket; the drive means being operative to reciprocate the piston and alternately provide an intake stroke and an exhaust stroke; an air inlet passageway through the piston communicating the chamber with atmosphere; means including a liquid inlet passageway through the plug for communicating the chamber with the reservoir; means including an outlet passageway through the plug for flow of the liquid and air from the chamber to the freezing compartment; and valve means associated with each said passageway to allow flow of liquid and air into the chamber during the intake stroke while preventing flow through the outlet and vice versa during the exhaust stroke.

3,898,867

CONDENSER FOR CONDENSING A REFRIGERANT

Bror Gustav Andersson, Sodergatan 31, and Benkt Reino Andersson, Rohdes vag, both of Varberg, Sweden

Filed Apr. 2, 1973, Ser. No. 346,882
Int. Cl. F25b *39/04*
U.S. Cl. 62—507 **6 Claims**



1. A condenser for a compressor type refrigerating plant comprising:

a vessel having sidewalls and two end walls for holding a body of condensed refrigerant, said vessel having inlet means and outlet means for maintaining said vessel substantially filled with condensate;

at least one hollow member sealingly fitted into said end walls of said vessel to form a passage for cooling air through said vessel within its sidewalls;

said inlet means including at least one nozzle for injecting vapor state refrigerant opening a sufficient distance from the top portion of said vessel to provide a satisfactory path for the vapor to be transferred into liquid state by direct contact with the body of condensate; and

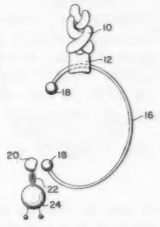
said vessel forming a part of a larger unit, which is divided into two compartments by means of an internal wall being disposed parallel to said end walls of said vessel, one of said two compartments forming said vessel, said at least one hollow member being enclosed in a guide tube, said member and said guide tube both extending through the internal wall, said guide tube adjacent to each end wall of said vessel having at least one opening for communication with the surrounding compartment, said guide tube thus forming a communication between said two compartments.

3,898,868

COMBINED TIARA AND EARRINGS WITH DETACHABLE EARRING DEVICES

Frederica W. Tomlinson, 68 Harriman Ave., Hempstead, N.Y. 11550

Filed June 24, 1974, Ser. No. 482,008
Int. Cl.² A44C *15/00, 7/00*
U.S. Cl. 63—2 **1 Claim**



1. An article of jewelry comprising:

first and second C shaped members;

four sphere shaped termination elements, each element being secured to a corresponding end of a corresponding one of said members;

first and second earring devices, each device being provided with a cup shaped element and an ornament secured by a flexible link to the cup element, each cup element detachably engaging one of said termination elements of a respective one of said members;

an elongated curved tiara; and

first and second loops, each loop being secured to a corresponding one of the ends of the tiara and also being secured to a corresponding one of said members intermediate the termination elements of said corresponding one member, each member being slidably and rotatably disposed in the corresponding loop.

3,898,869

RING WITH SEALED MOUNTING CONTAINING MIRROR SURFACE

George R. Reneer, Conroe, Tex., assignor to Star Engraving Company, Houston, Tex.

Filed Jan. 21, 1974, Ser. No. 434,994
Int. Cl. A44c *17/02*
U.S. Cl. 63—15 **6 Claims**

1. A finger ring comprising:

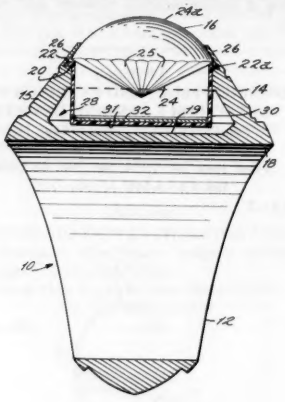
a rigid structure of a shape to at least partially encircle a finger, said structure having a cavity closed inwardly by a solid backing and opening outwardly within an outwardly facing annular area,

a generally cup-shaped member disposed within said cavity and having an annular lip engaging said annular area,

a decorative stone disposed in peripheral engagement with said annular lip and having upper surface means and bottom surface means, said stone being of a material permitting light to pass therethrough between said upper and bottom surface means,

means providing a mirror surface on said cupshaped member in a position to face the bottom surface means of said stone so that light passing through said stone from the upper surface means thereof through the bottom surface means thereof is reflected from said mirror surface to pass through said stone from the bottom surface means through the upper surface means thereof, and

means for fixedly securing said stone to said rigid structure said securing means holding said stone in said peripheral



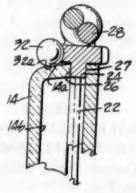
engagement with said lip thereby providing a moisture seal for the interior of said cup to protect the bottom surface means of said stone and said mirror surface.

3,898,870

LOCKET HAVING COVER OF LOCALLY COMPRESSIBLE PLASTIC RETAINED BY MEANS WHICH MINIMIZES RETAINING CONTACT THEREWITH

Kent L. Jacobson, Moraga, Calif., assignor to Dick Tyrrell Jewelers, Inc., Walnut Creek, Calif.

Filed May 8, 1974, Ser. No. 468,186
Int. Cl.[2] A44C *25/00*
U.S. Cl. 63—18 **10 Claims**



1. A jewelry locket of the kind in which a front crystal cover is removably retained in a frame to permit a photograph or other display image to be installed and removed or replaced beneath the crystal, said locket comprising,

a peripheral, cast metal frame having an integrally formed, inwardly projecting support providing a flat front surface which is recessed from the front surface of the frame,

a crystal cover molded from a plastic material that is clear and transparent and that also can be deformed by being compressed in a localized area without cracking,

said crystal cover having peripheral configuration to fit closely in the frame with a back surface of the cover engaged with said flat front support surface,

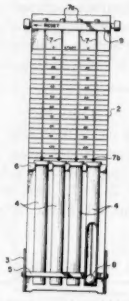
and means for releasably retaining said crystal cover in place when so fitted in the frame while minimizing retaining contact therewith, said means comprising a plurality of bead-shaped retainer members cast integrally on the frame and spaced about the periphery of the frame for engaging the crystal cover only at selected locations on the periphery thereof in localized areas of compression whereby the plastic crystal cover is securely held in place in the frame during normal use of the locket but can readily be snapped out of and back into the frame when it is desired to replace the photograph or other image by the coaction between the bead-shaped retainer members and the compressible plastic crystal cover.

3,898,871

VISCOSITY COMPARATOR

Fernand L. Gerin, Red Bank, N.J., assignor to The Gerin Corporation, Avon, N.J.

Filed June 10, 1974, Ser. No. 477,606
Int. Cl.[2] G01N *11/12*
U.S. Cl. 73—57 **4 Claims**



1. A viscosity comparator having a release bar which is pushed in one direction to flex a plurality of separate springs for the purpose of releasing a number of weighted rods so that they may drop by gravity and which bar, when released after being so pushed, is moved in the opposite direction by said springs returning to their original position, a second bar in the path of travel of the release bar arranged to be moved by the release bar when said release bar is pushed to flex said springs, and suddenly releasable restraining means for holding the second bar against movement by the release bar until pressure is applied to the release bar sufficient to effect the sudden release of said restraining means.

3,898,872

TENSIOMETER FOR SOIL MOISTURE MEASUREMENT

Percy E. Skaling, and Whitney Skaling, both of Santa Barbara, Calif., assignors to Soilmoisture Equipment Corporation, Goleta, Calif.

Filed Oct. 19, 1973, Ser. No. 408,174
Int. Cl.[2] G01N *19/10*
U.S. Cl. 73—73 **10 Claims**

1. A tensiometer for measuring soil moisture content, comprising:

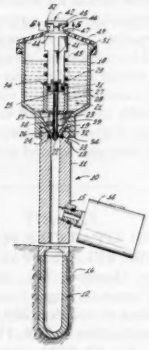
a sealable vessel normally filled with liquid and having walls with a porous section to be placed in the soil;

means connectable to the liquid in said vessel for measuring the pressure therein and hence the moisture content of the soil;

liquid reservoir means having an exit to said vessel; and

valve means selectively operable for sealing said exit and for opening said exit to allow liquid from said reservoir means to refill said vessel, said valve means including pump means for automatically purging gas bubbles from said vessel, said pump means including means defining a secondary passage from said reservoir means to said

vessel when said exit is open, and said pump means being responsive to opening of said valve means, for pumping

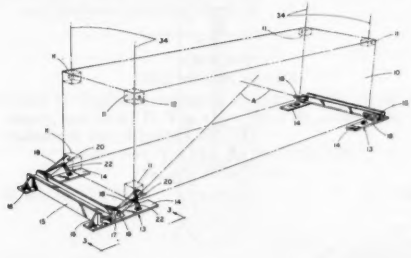


liquid into said vessel through said secondary passage to thereby sweep gas bubbles from its walls.

3,898,873
TESTING DEVICE AND METHOD FOR TESTING CONTAINERS

John J. Glassmeyer, Covington, Ky., assignor to Pullman Incorporated, Chicago, Ill.

Filed July 16, 1973, Ser. No. 379,697
Int. Cl.[2] G01N *3/08*
U.S. Cl. 73—88 R **9 Claims**



1. A testing device for a container having upper and lower connector elements located at the upper and lower corners of said container, each connector element including at least one horizontal extending recess, a lifting device connected to the upper connector elements for lifting the container and for effecting exertion of an upward reactive force on said upper connector elements, said testing device comprising

a horizontal support surface and a plurality of supports located on said surface, each of said supports including a base,

a support pedestal on said base extending upwardly relative thereto,

said pedestal of each support including an arm and strut means connected to said arm, said arm and said strut means being hingedly connected to said base in opposed and spaced relation to each other such that said strut means extends diagonally upwardly from said base,

said arm having an opening alignable with the recess of a lower connector element of the container, the opening being disposed above said support surface,

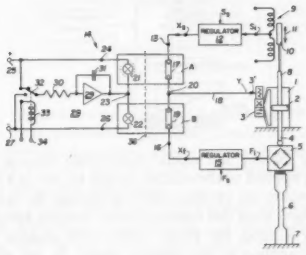
said strut means including longitudinally adjustable means for effecting hinged movement of said arm relative to said base and alignment of the opening of said arm with the recess of a lower connector element, and

removable connecting means receivable in the opening of each arm and the aligned recess of each lower connector element for connecting the arms to the lower connector elements of the container in order that the lower connector elements of the container support the container above and in spaced relation to said surface so that testing of the lower connector elements of the container is effected as the lifting device is lowered relative to the container.

3,898,874
CONTROL INPUT SWITCHING APPARATUS

Carl Martin Wawra, Bensheim-Auerbach, Germany, assignor to Firma Carl Schenck AG, Darmstadt, Germany

Continuation of Ser. No. 232,851, March 8, 1972, abandoned. This application Apr. 15, 1974, Ser. No. 460,788
Claims priority, application Germany, Dec. 23, 1971, 2164384
Int. Cl.[2] G01N *3/08*
U.S. Cl. 73—90 **20 Claims**



1. An apparatus for switching a control input of an adjustment member in a material testing machine from an output of a first regulating means of said material testing machine to an output of a second regulating means of said material testing machine and vice versa, comprising first variable resistor means directly connected to said control input to continuously apply the output of said first regulating means to said control input independently of the voltage at said control input, second variable resistor means directly connected to said control input to continuously apply the output of said second regulating means to said control input independently of the voltage at said control input, whereby the proportion of the outputs of said regulating means at said control input of the adjustment member is dependent upon the resistance of said first and second resistor means respectively, varying means operatively coupled to said first and second variable resistor means for varying the resistance thereof, and means for controlling said varying means whereby the resistance of one of said first and second variable resistor means is increased while the resistance of the other of said first and second variable resistor means is simultaneously decreased and vice versa.

3,898,875
METHOD AND APPARATUS FOR TESTING ELECTRIC MOTORS

Donald E. Knoop, Benton Harbor; Marc C. Loessel, St. Joseph, and Arne M. Nystuen, Stevensville, all of Mich., assignors to Whirpool Corporation, Benton Harbor, Mich.

Filed Oct. 9, 1973, Ser. No. 404,259
Int. Cl.[2] G01L *3/22*
U.S. Cl. 73—116 **10 Claims**

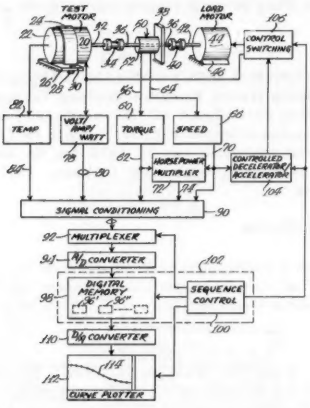
1. A method of testing an electric motor having a motor

shaft rotatable with respect to a motor housing, comprising the steps of:

rigidly constraining the motor housing to a fixed position during the entire testing period,

rotating the motor shaft by a force external to the electric motor to accelerate the motor shaft to approximately a running speed without coupling electric power to the electric motor,

applying electric power to the electric motor after terminating the external force,



variably loading the motor shaft while electric power is being applied to the electric motor by use of a load force external to the electric motor to change the speed in one direction from the approximately running speed,

variably loading the motor shaft while electric power is being applied to the electric motor by use of the load force external to the electric motor to change the speed in an opposite direction to return to the approximately running speed, and

measuring the torque produced by the rotating motor shaft while electric power is being applied and the motor housing is being rigidly constrained and the motor shaft is being variably loaded.

3,898,876

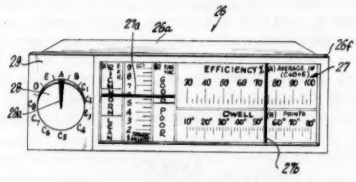
INTERNAL COMBUSTION ENGINE PERFORMANCE EFFICIENCY ANALYZER AND METER DEVICE

Gilbert F. Miceli, 82 Florida St., Long Beach, N.Y. 11561

Filed Feb. 14, 1974, Ser. No. 442,510

Int. Cl.[2] G01M *15/00*

U.S. Cl. 73—117.3 **10 Claims**



1. An internal combustion engine efficiency analyzer and indicating device comprising in combination: a plurality of at least first and second separate analyzer means for analyzing at least first and second functions selectively of efficiency in performance of an internal combustion engine in the burning of fuel therein; meter means for separate monitoring of each of said first and second separate analyzer means and for additionally separately monitoring combined signals of said plurality; selector switch means for separately selecting for monitoring at least separately each of said first and second separate analyzer means respectively and for separately selectively monitoring combined signals of at least some of said plurality; and circuit integration means for selectively placing said voltmeter in circuit alternately with output lead of at least said first and second separate analyzer means when said selector means is positioned for selectively monitoring a single voltage signal from at least one of said first and second separate analyzer means, and for connecting said voltmeter to be simultaneously in circuit with said some of said plurality when said selector switch means is positioned for monitoring a combined signal of at least the first and second separate analyzer means.

3,898,877

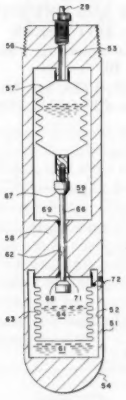
METHOD AND APPARATUS FOR MEASURING PRESSURE RELATED PARAMETERS

Billy W. McArthur, Houston, Tex., assignor to Sperry-Sun Well Surveying Company, Sugar Land, Tex.

Continuation-in-part of Ser. No. 209,856, Dec. 20, 1971, abandoned. This application Nov. 8, 1973, Ser. No. 414,062

Int. Cl. E21b *47/06*

U.S. Cl. 73—151 **12 Claims**



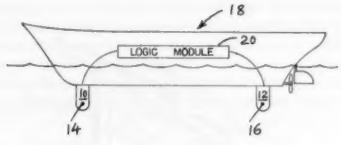
1. A method for determining pressure related parameters of an environment and indicating such changes at a remote location, including the steps of: placing an expansible chamber in the environment where pressure parameters are to be determined, the exterior of such chamber being in communication with the environment, placing an enclosed passageway between the chamber and the remote location with one end of such passageway in sealed communication with the chamber and the other end of such passageway in sealed communication with a pressure responsive apparatus for detecting pressure changes, such other end also being in communication with a fluid supply means, introducing a fluid into the passageway and chamber, and detecting the pressure at which characteristic changes occur in the rate of pressure increase in the passageway and chamber to determine parameters of pressure in the environment.

3,898,878

SHIP SPEED INDICATOR

Lewis A. Stallworth, East Lyme, and Robert R. Hartley, Niantic, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 15, 1974, Ser. No. 497,607
Int. Cl.[2] G01C 21/10
U.S. Cl. 73—181 3 Claims



1. A ship speed indicator for measuring a ship's speed in a body of water comprising:

a first acoustic projector-receiver module being adapted to be mounted at a first preselected point on the external bottom of the ship, said first acoustic projector-receiver module including a first acoustic transmitter, a first acoustic receiver and a first filtering circuit and a first clipper circuit;

a second acoustic projector-receiver module being adapted to be mounted at a second preselected point on the external bottom of the ship, said second acoustic projector-receiver module including a second acoustic transmitter, a second acoustic receiver and a second filtering circuit and a second clipper circuit, said first and second points being away from the area of turbulence on the external bottom of the ship and the line joining said first and second points being parallel to the line of direction of the ship's motion; and

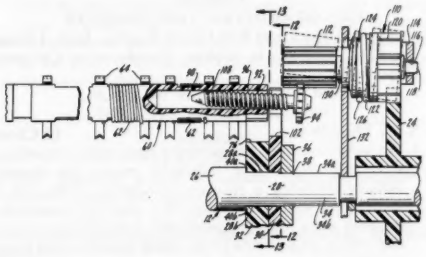
a logic module being mounted inside the ship, said logic module being in communication with said first and second projector-receiver modules.

3,898,879

TELEVISION TUNER

Norman D. Cappelle, Arlington Heights; Walter Meyer, McHenry, and Henry H. Tap, Cary, all of Ill., assignors to Oak Industries, Inc., Crystal Lake, Ill.

Filed Nov. 9, 1973, Ser. No. 414,326
Int. Cl. F16h 35/18
U.S. Cl. 74—10.15 13 Claims



1. A TV tuner having a housing and a rotating channel selector shaft mounted in said housing,

oscillator coil means mounted on said shaft, a plurality of fine tuning screws carried by said oscillator coil means and axially adjustable relative thereto,

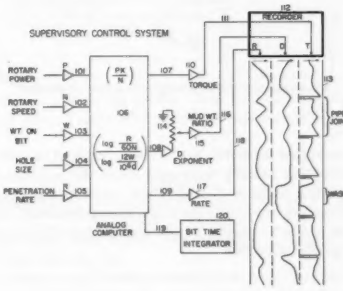
and means mounted on said shaft for holding each screw in an adjusted position and including means for biasing each screw toward said shaft.

3,898,880

ELECTRONIC SUPERVISORY MONITORING METHOD FOR DRILLING WELLS

Ray M. Kelseaux; Harold J. Dobbs, both of Tulsa, Okla., and Frank D. Priehe, Houston, Tex., assignors to Cities Service Oil Company, Tulsa, Okla.

Continuation of Ser. No. 335,191, Feb. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 156,645, June 25, 1971, Pat. No. 3,785,202. This application July 15, 1974, Ser. No. 488,364
Int. Cl.[2] E21B 49/00
U.S. Cl. 73—151.5 2 Claims



1. A method for monitoring and recording of a drilling operation wherein a drill string having a kelly and a drill bit is turned by means of a rotary motor, said method comprising:

a. inputting a drilled hole size and a mud weight ratio into a computer means for computing;

b. sensing each of the rotary motor power, the rotary motor speed, the weight on the drill bit and the penetration rate of the drill bit and feeding the sensed value of each into said computer means as an electrical signal;

c. computing by said computer means a corrected *d* exponent from said weight on the drill bit, said penetration rate of the drill bit, said drilled hole size, and said mud weight ratio based upon the signaled value of each as fed into said computer means and simultaneously computing by said computer means a rotary motor torque from the signal values of said rotary motor speed and said rotary motor power as are fed into said computer means;

d. feeding said corrected *d* exponent and said rotary motor torque from said computer means into means for recording where each is recorded along with said rate of penetration of the bit.

3,898,881

APPARATUS FOR MEASURING THE VELOCITY OF FLOW OF AN ELECTRICALLY CONDUCTIVE FLUID

James J. Darby, Jr., Rockville, Md., assignor to Marsh-McBirney, Inc., Rockville, Md.

Filed Sept. 21, 1973, Ser. No. 399,733
Int. Cl. G01p 5/08
U.S. Cl. 73—181 1 Claim

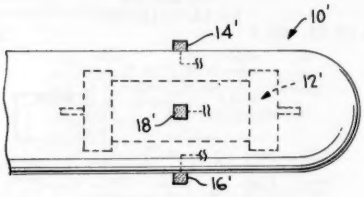
1. A velocity meter for measuring the relative velocity of an electrically conductive fluid, comprising

a. a cylindrical probe adapted for insertion into the fluid normal to a given direction of relative movement (X) between said probe and said fluid;

b. means contained within said probe for producing in the fluid a magnetic field the axis of which is parallel with the longitudinal axis of said probe; and

c. signal generating means for providing an electric signal dependent upon the relative velocity of movement between said probe and the fluid, said signal generating means including two pairs of diametrically arranged elec-

trodes mounted on the external circumferential surface of said probe, said electrodes lying in a plane normal to the axis of said probe, the electrodes of one electrode pair being disposed at the ends of a first diameter of said probe, respectively, the electrodes of the other electrode pair lying at the ends of a second probe diameter normal



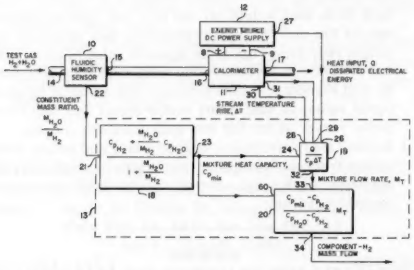
to said first diameter, respectively, each of said electrodes projecting radially outwardly from the external circumferential surface of said probe, each of said electrodes projecting outwardly from the circumferential surface of said probe a distance of approximately 0.05 inch per inch of probe diameter.

3,898,882

FLOW MEASURING APPARATUS

Paul R. Prokopius, Brecksville, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 28, 1974, Ser. No. 447,124
Int. Cl.[2] G01F *1/88*
U.S. Cl. 73—194 M **10 Claims**



1. Apparatus for measuring the instantaneous mass flow rate of a binary gas stream comprising:

means for generating a signal representative of the mass flow ratio of the binary gas;

means for increasing the temperature of the binary gas;

means for measuring the temperature increase of the binary gas caused by said second named means and generating a signal indicative thereof;

means for generating a signal representative of the energy required by said second named means to produce the temperature increase measured by said third names means; and

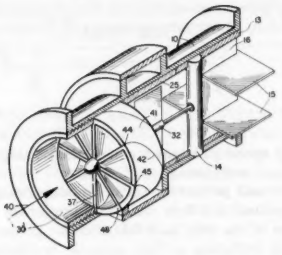
means for operating on the signals of said first, third and fourth named means to yield a signal indicative of the mass flow rate of one of the gases of said binary gas.

3,898,883

STATOR ASSEMBLY FOR FLOWMETERS AND THE LIKE

Zdenek Vaclav Kozak, and Joseph Jaromir Stupecky, both of North Hollywood, Calif., assignors to Zdenek Kozak, North Hollywood, Calif.

Division of Ser. No. 218,094, Jan. 17, 1972, Pat. No. 3,792,611. This application May 18, 1973, Ser. No. 361,539
Int. Cl. G01f *1/10*
U.S. Cl. 73—231 R **5 Claims**



1. An assembly for imparting a swirl to fluid past therethrough comprising a plurality of substantially identical elements each including rim segment portion and vane portion; said rim segment portion including an outer surface constituting a portion of a circular tube with two edges defining inlet and outlet surfaces respectively and the remaining two edges defining surface configurations mating with the next segment edge to define an uninterrupted tubular rim;

wherein the surface configurations of said remaining two edges have portions that extend transverse to the axis of said tubular rim; and

the peripheral length of said rim segment being equal to the circumference of the assembly divided by the number of vanes;

said vane portion including the end joining said rim portion having a curve corresponding to the desired swirl deflection defining an axial hub opening;

said assembly including means axially biasing said assembly elements together to define a rigid assembly;

said biasing means comprising an encircling tubular housing, a fixed ring within said tubular housing and an axially tightenable ring embracing said stator assembly.

3,898,884

INDOOR/OUTDOOR THERMOMETER

Evan Lloyd Hopkins, and Ross Eugene Hopkins, both of Emporia, Kans., assignors to Hopkins Manufacturing Company, Emporia, Kans.

Filed Aug. 6, 1973, Ser. No. 385,813
Int. Cl.[2] G01K *1/06, 1/14, 5/62*
U.S. Cl. 73—339 C **10 Claims**

1. An indoor/outdoor thermometer apparatus comprising:

bisegmental temperature indicating means for simultaneously providing a relative temperature indication in connection with a first side of a sheet of transparent material and a relative temperature indication in connection with a second side of the sheet material, said bisegmental temperature indicating means comprising:

a first housing carrying:

first temperature sensing means attachable to a first side of a sheet of transparent material; and

first pointer means mounted for angular displacement in response to the sensing of a temperature change by said first sensing means for providing a relative indication of a temperature being sensed;

a second housing unattached relative to said first housing and carrying:

second temperature sensing means attachable to a second side of the sheet of transparent material; and

second pointer means mounted for angular displacement in response to the sensing of a temperature change by said second sensing means for providing a relative indication of a temperature being sensed;

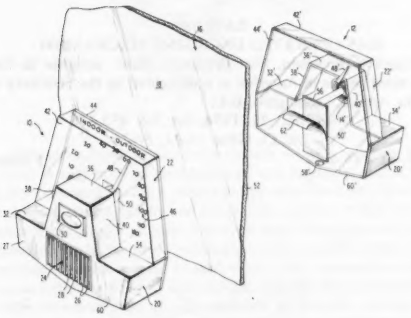
said second pointer means being visible through said first and second housing means;

each housing including adhesive attachment means operable to attach said first and second housings to the sheet of transparent material independently of each other to permit said bisegmental temperature indicating means to be attached at any preselected position on the transparent sheet of transparent material;

said attachment means being disposed relative to said first and second pointer means such that said first and second pointer means are visible through transparent portions of said first housing when said first and second housings are attached to the sheet of transparent material;

one of said housings including graduated scale means cooperable with said first and second temperature sensing means for simultaneously providing on a single scale temperature readings for both sides of the sheet of transparent material; and

each of said housings including visual alignment means for aligning said first and second housings to orient said first and second pointers for substantially co-axial displacement in substantially superimposed paths along said graduated scale to permit a temperature reading of both sides of the sheet of transparent material to be taken simultaneously in connection with the single scale.



3,898,885

TRANSDUCERS

Michael Frederick Russell, Ickenham, England, assignor to C.A.V. Limited, Birmingham, England

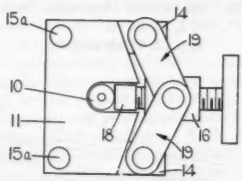
Filed Oct. 15, 1973, Ser. No. 406,216

Claims priority, application United Kingdom, Oct. 13, 1972, 47335/72

Int. Cl. G01l *9/04*

U.S. Cl. 73—398 AR **10 Claims**

1. A fluid pressure transducer comprising a body portion, at least a pair of members having surfaces engageable with the wall of a pipe, said pair of members being adjustably mounted so as to permit engagement of said surfaces with the wall of the pipe, said body portion including a pair of spaced side plates, said members being positioned intermediate said plates, said plates frictionally engaging said members and acting to damp movement thereof as the diameter of the pipe varies with variation of the fluid pressure therein, portions of said members being of reduced section so as to be distorted by



the pressure variations in the pipe and sensing elements mounted on said reduced portions of said members.

3,898,886

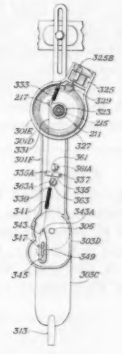
LEG MOUNTED DISTANCE MEASURING DEVICE AND GUIDANCE SYSTEM

Alton B. Hamm, Fort Worth, Tex., assignor to Hamm Systems, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 291,776, Sept. 25, 1972. This application Mar. 25, 1974, Ser. No. 454,478

Int. Cl. G01c *21/00*

U.S. Cl. 73—432 **28 Claims**



1. A distance measuring device comprising: support means, means for coupling said support means to a person's leg,

output producing means coupled to said support means for producing an output, and

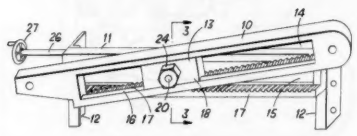
following means for following movement of the foot relative to the leg as a person takes a step for actuating said output means to produce an output indicative of the distance covered by said step and which is a function of the change in the angular relationship occurring between the foot and the leg as a person takes a step

said following means being coupled to said output indicative of the distance covered by said step and producing means and including means adapted to be coupled to a person's foot for following movement of the foot relative to the leg as a person takes a step.

3,898,887
STROKE VARYING MECHANISM

Graham Cameron Grant, 16/49 Campbell Parade, Manly Vale, Sydney, New South Wales, Australia (2093)

Filed Sept. 10, 1973, Ser. No. 396,031
Claims priority, application Australia, Sept. 13, 1972, 0429/72; Nov. 17, 1972, 1268/72
Int. Cl. F16h *19/04*
U.S. Cl. 74—29 **3 Claims**

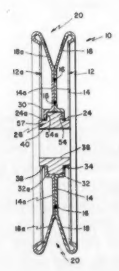


1. A lever mechanism comprising,
a lever element having a rack portion,
a fulcrum pivotably supporting the lever element and which is movable to permit selective positioning thereof intermediate the ends of the lever element,
a stationary support member disposed adjacent and parallel to the lever element, said stationary member having a rack portion, and
means associated with the fulcrum engaged in driving relationship with the lever element for preventing free translation of the lever element with respect to the fulcrum but being operative to permit the selective positioning of the fulcrum between the ends of the lever element whilst the pivotable support between the fulcrum and the lever element is preserved, said fulcrum associated means including,
two slide blocks,
one said slide block being slide mounted to the lever element and the other said slide block being slide mounted to the stationary support member,
an axle extending between said slide blocks, and,
a pinion carried by said axle and engaged in said driving relationship with the respective rack portion of said lever element and said stationary member.

3,898,888
PULLEY CONSTRUCTION

Charles C. Frost, Kentwood; Douglas J. Van Der Meulen, Martin, and Siegfried K. Weis, Grand Rapids, all of Mich., assignors to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed Mar. 30, 1973, Ser. No. 346,329
Int. Cl. F16h *55/44*
U.S. Cl. 74—230.8 **11 Claims**

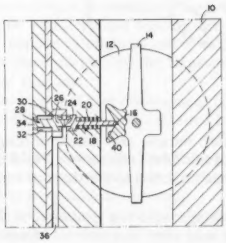


1. A pulley wheel construction comprising in combination: a pair of identical discs and an annular hub member, said discs having a central opening in which said hub member is positioned; said hub member having a central bore for receiving a mounting shaft; each said discs having an inner flange means formed about said disc opening, a web portion and an annular outer portion, each of said inner flange means including an annular surface of reference distinct from the remaining surface of said flange means and said web portion likewise including an annular surface of reference distinct from the remaining surface of said web portion, said discs being joined back-to-back whereby said outer portions form an outwardly opening belt-receiving groove and said flange means form an annular cup-shaped pocket for receiving, holding and indexing said hub member therein to prevent lateral and radial movement relative to said discs when said discs are joined together, said annular surfaces of reference on said flange means abutting said hub member and said annular surfaces of reference on said web portion abutting each other providing a positive and accurate relationship between said hub member and discs and said discs with each other and means for interconnecting said hub member to said discs and said discs to each other.

3,898,889
GAS-OPERATED UNCAGING MECHANISM

Bernard F. Bickman, New Brighton, Minn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 21, 1974, Ser. No. 453,478
Int. Cl. G01c *19/24, 19/26*
U.S. Cl. 74—5.12 **1 Claim**

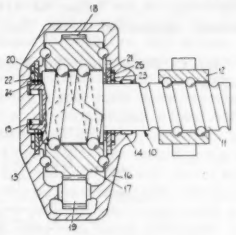


1. In a gyro having a housing, a gimbal structure and a rotor mounted in the gimbal; a caging mechanism comprising:
a funnel shaped notch in said gimbal,
a caging pin slideably mounted in said housing and adapted to project inwardly into said notch,
a spring surrounding said caging pin and normally urging said pin outwardly,
a latching pin in alignment with said caging pin and slideably mounted with a friction fit in said housing, the inner end of said latching pin abutting the outer end of said caging pin, the outer end of said latching pin extending through said housing,
both of said forementioned pins being provided with enlarged portions intermediate their ends slideably received in a tubular chamber in said housing thus providing an annular gas chamber between said enlarged portions, and a gas passageway in said housing communicating at one end with said annular gas chamber and at its other end with a source of spinup gas pressure,
whereby admission of gas pressure to said annular gas chamber forces said latching pin outwardly while maintaining said caging pin in engagement with said notch, decline of said gas pressure permitting said caging pin to move outwardly under the influence of said spring to uncage the mechanism of said gyro.

3,898,890
SCREW-TYPE ACTUATORS

John Richard Simmons, and Trevor John Hammond, both of Wolverhampton, England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Feb. 19, 1974, Ser. No. 443,793
Claims priority, application United Kingdom, Feb. 27, 1973, 9692/73
Int. Cl. F16h 27/02
U.S. Cl. 74—89.15 4 Claims

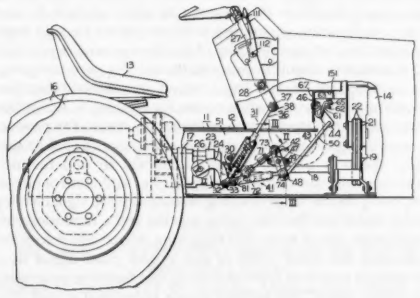


1. A screw-type actuator comprising a body, a screw journalled in said body, a first ball-type nut engaging said screw, a drive element having a thread of opposite hand to said screw and being connected to said screw for axial and rotary movement therewith, a second ball-type nut engaging said drive element thread, said first nut being freely movable axially and rotationally with respect to said second nut, means for applying an external drive to said second nut, and first and second brake members respectively operable to prevent rotation of said screw in opposite directions, said brake members being engageable by said drive element in response to axial movement of said drive element in respective opposite directions, whereby said screw is restrained by said brake members against rotation in response to axial loads applied in either direction to said first nut, and application of a drive to said second nut is operative to release whichever of said brake members is actuated.

3,898,891
FOOT AND HAND CONTROL FOR HYDROSTATIC TRANSMISSION

Marcus J. Colloton, Marshalltown, Iowa, assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 31, 1974, Ser. No. 519,571
Int. Cl.[2] G05G 11/00; B60K 23/00
U.S. Cl. 74—474 6 Claims



1. In a vehicle having a hydrostatic forward/reverse transmission including a reversible variable displacement pump with a displacement control arm pivotable in opposite directions from a neutral position to forward and reverse positions, a control mechanism comprising:

a manually operated forward/reverse control on said vehicle including

a hand lever shiftable in opposite directions from a neutral position to forward and reverse positions,

detent means releasably retaining said hand lever in its positions of adjustment and

a linkage interconnecting said hand lever and said control arm whereby when said hand lever is in its neutral, forward and reverse positions said control arm will be in its neutral, forward and reverse positions, respectively, and an inching control including

a foot pedal mounted on said vehicle movable by an operator's foot from a released position to an operated position,

a pivot structure pivotally mounted on said vehicle on an axis parallel to the pivot axis of said control arm,

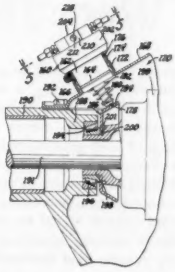
first and second lost motion links pivotably interconnecting said control arm and said pivot structure at points on the latter at opposite sides of its pivot axis, said first lost motion link having relatively extensible and contractible parts and confronting abutments limiting contraction thereof and said second lost motion link having relatively extensible and contractible parts and confronting abutments limiting extension thereof, and

motion transmitting means interconnecting said pedal and pivot structure whereby movement of said pedal to its operated position pivots said pivot structure in one direction thereby causing at least one of said lost motion links to force said control arm to its neutral position.

3,898,892
DIFFERENTIAL MOUNTED SINGLE STAGE DIAPHRAGM OPERATED PUMP

Manfred P. H. Schlanzky, Frankenmuth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 307,331, Nov. 16, 1972, Pat. No. 3,841,796. This application Nov. 7, 1973, Ser. No. 413,503
Int. Cl.[2] F16H 1/38; B60S 9/00; F01D 5/18
U.S. Cl. 74—710 2 Claims



1. An air compressor and drive assembly for a vehicle leveling system comprising an outer housing for a vehicle drive differential, said outer housing having an inclined support surface with an enlarged opening therein, a flange projecting outwardly from said outer housing around the periphery of said opening, a differential drive pinion rotatably supported in said outer housing, a differential case operatively connected to said differential drive pinion rotatably mounted in said outer housing, a tubular axle housing secured to said differential case and extending outwardly therefrom, said differential case having a projecting cylindrical shoulder portion extending into one end of said axle housing for rotation therein, bearing means operatively mounted between said axle housing and said projecting cylindrical shoulder portion for rotatably

supporting said differential case in said outer housing, a cup shaped cam secured to said differential case adjacent to said shoulder portion for rotation therewith, said cam having an inclined peripheral surface with plurality of spaced camming lobes formed thereon, said peripheral surface of said cam being generally parallel to said inclined support surface of said outer housing, air compressor means for the vehicle leveling system, said compressor including a compressor housing externally mounted with respect to said outer housing, said compressor housing having projecting shell portion extending into said opening and secured to said support flange, a reciprocating drive shaft extending from said compressor housing interiorly of said outer housing, said drive shaft including an inner end thereon engageable with said inclined cam surface, spring means for biasing said reciprocating shaft against said inclined surface of said cam, said cam rotating in response to rotation of said differential casing to cause reciprocation of said shaft against the force of said spring means, said compressor means including means responsive to reciprocation of said shaft for continuously compressing air during operation of said differential drive pinion and rotation of said differential case.

3,898,893

SPEED CHANGE CONTROLLING DEVICE IN AN AUTOMATIC TRANSMISSION FOR AN ELECTRIC CAR

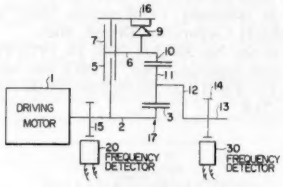
Masanao Hashimoto, and Kiyoshi Ohnuma, both of Toyota, Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Oct. 23, 1973, Ser. No. 408,559

Claims priority, application Japan, Oct. 23, 1972, 47-105327

Int. Cl.[2] B60K *41/08*

U.S. Cl. 74—859 **3 Claims**



1. A speed change control device in an automatic transmission for electric automobiles having a speed change gear mechanism connected directly to a vehicle driving motor, comprising: a hydraulic engaging means for accomplishing speed change meshing of said gear mechanism; valve means actuated to make a change-over operation by a speed change signal to supply operating oil pressure to said hydraulic engaging means; a speed change signal producing means to produce and commute a speed change signal to said valve means in response to the vehicle running condition; a neutral setting means to temporarily release said hydraulic engaging means by said valve means at the time of speed change to bring said automatic transmission into a neutral position; a motor speed control means to vary the rotational frequency of said motor during the period of the neutral position and to synchronize the rotational frequency of the motor with the rotational frequency of an output shaft of said automatic transmission; and means for maintaining synchronization of the rotational frequencies of said motor and said output shaft until oil pressure, sufficient for full meshing of said gear mechanism, is supplied to said hydraulic engaging means; wherein said motor speed control means includes means for comparing the rotational speed of said motor with that of the output shaft of said automatic transmission and varying field current of said motor in accordance with the difference between the rotational speeds of said motor and output shaft in consideration of the speed change ratio of said speed change gear mechanism, and chopper means for controlling the field current of said motor, said chopper means upon shift-down being kept turned-off so as to rapidly increase the rotational speed of said motor while said chopper means upon shift-up remains turned-on so as to rapidly decrease the rotational speed of said motor.

3,898,894

ENGINE IGNITION TIMING CONTROL

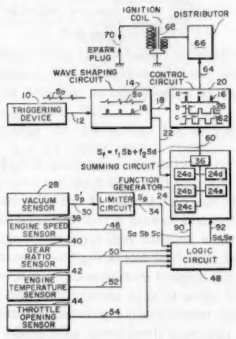
Shigeo Aono, Tokyo, and Norio Mizuguchi, Yokosuka, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Nov. 19, 1973, Ser. No. 416,835

Claims priority, application Japan, Nov. 20, 1972, 47-116327

Int. Cl. B60k *23/00;* **F02p** *5/08*

U.S. Cl. 74—866 **2 Claims**



1. An ignition spark timing control system for an internal combustion engine of a motor vehicle equipped with a power transmission comprising, in combination, an engine speed sensor to sense engine speed and to produce an analog signal dependent on said engine speed, a gear ratio sensor to sense a plurality of gear ratios of said power transmission and to produce a plurality of analog signals each representing one of said gear ratios of said power transmission, an engine temperature sensor to sense engine temperature and to produce an analog signal dependent on said engine temperature, a throttle opening sensor to sense throttle opening in an air induction system of said engine and to produce an analog signal dependent thereon, a vacuum sensor to sense vacuum in the engine intake manifold and to produce an analog signal dependent thereon, a logic circuit connected to said engine speed sensor, said gear ratio sensor, said engine temperature sensor, said throttle opening sensor and said vacuum sensor for producing logic output signals in dependence on said signals from said sensors, a function generating unit connected to said logic circuit and including a plurality of function generating circuits and a summing circuit connected thereto for generating signals as functions of said logic output signals, said function generating unit also including means for generating a function generating unit output signal, a triggering device for producing a pulse signal with a repetition rate proportional to said engine speed, a control circuit connected to said function generating unit and said triggering device, said control circuit comprising means for generating an output pulse signal having a pulse width less than the pulse spacing and a repetition rate of said pulse signal from said triggering device and means for modulating the pulse width of said output pulse signal from said control circuit in dependence on said function generating unit output signal, and ignition means connected to said control circuit for effecting ignition in said engine in response to the modulated output pulse signal.

2. An ignition spark timing control system for an internal combustion engine of a motor vehicle equipped with a power

transmission comprising, in combination, an engine speed sensor to sense engine speed and to produce an anlog signal dependent on said engine speed, a gear ratio sensor to sense a plurality of gear ratios of said power transmission and to produce a plurality of analog signals each representing one of said gear ratios of said power transmissions, an engine temperature sensor to sense engine temperature and to produce an anlog signal dependent on said engine temperature, a throttle opening sensor to sense throttle opening in an air induction system of said engine and to produce an analog signal dependent thereon, a vacuum sensor to sense vacuum in the engine intake manifold and to produce an analog signal dependent thereon, a logic circuit including a first AND gate having inputs connected to said throttle opening sensor and said engine speed sensor through first and second comparators, respectively, a second AND gate having inputs connected to said second comparator and said gear ratio sensor, said second AND gate receiving a gear ratio signal representing neutral condition of said power transmission, a third AND gate having inputs connected to said second comparator and said gear ratio sensor, said third AND gate receiving a gear ratio signal representing a first gear ratio in said power transmission, a first OR gate having inputs connected to said gear ratio sensor and receiving gear ratio signals representing a second gear ratio, third gear ratio and fourth gear ratio in said power transmission, a fourth AND gate having inputs connected to said second comparator and an output of said first OR gate, a fifth AND gate having inputs connected to said engine temperature sensor through a third comparator and to said gear ratio sensor through a third comparator and to said gear ratio sensor, said fifth AND gate receiving said gear ratio signal representing said neutral condition of said power transmission, a second OR gate having inputs connected to said gear ratio sensor and receiving one of said third and fourth gear ratio signals therefrom, a sixth AND gate having inputs connected to said second comparator through an inverter and an output of said second OR gate, a logical product circuit connected to outputs of said first, second, third, fourth and fifth AND gate to produce a first set of logic signals at its output which is connected to one input of a function generating circuit, a third OR gate having inputs connected to the outputs of said first AND gate and the output of said sixth AND gate, a seventh AND gate having inputs connected through an inverter to the output of said third OR gate and said vacuum sensor through a fourth comparator, and a fourth OR gate having inputs connected to the output of said third OR gate and the output of said seventh AND gate to produce a second set of logic signals at its output which is connected to another input of said function generating unit, said function generating unit connected to said logic circuit comprising means for generating signals as functions of said logic signals and means to generate a function generating output signal, a triggering device for producing a pulse signal with a repetition rate proportional to said engine speed, a control circuit connected to said function generating unit and said triggering device, said control circuit comprising means for generating an output pulse signal having a pulse width less than the pulse spacing and a repetition rate of said pulse signal from said triggering device and means for modulating the pulse width of said output pulse signal from said control circuit in dependence on said function generating unit output signal, and ignition means connected to said control circuit for effecting ignition in said engine in response to the modulated output pulse signal.

3,898,895

METHOD OF ATTACHING TEETH TO AN EARTH DRILLING TOOL

Thomas L. Taylor, 111 W. 10th St., Odessa, Tex. 79761

Filed Jan. 14, 1974, Ser. No. 433,285

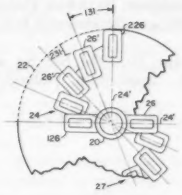
Int. Cl.[2] B21K *5/02;* **E21B** *9/22;* **E21C** *13/00*

U.S. Cl. 76—102 **6 Claims**

1. Method of attaching teeth to an earth drilling tool, having a flight intergrally attached to a central hub and a pilot bit affixed at the lower end thereof comprising the steps of:

attaching the flight to the hub so that a lower end thereof terminates adjacent the pilot bit;

forming a leading edge onto the flight by welding a plurality of spaced teeth receiving pockets therein which are arranged respective to one another so that when a cutting tooth is placed therein, a radial dimension thereof is disposed along a line drawn radially of the axial centerline of said hub, and a circumferential dimension thereof is disposed normal to said radially drawn line;



placing a first of said pockets adjacent to said hub, a last of said pockets adjacent to the outer periphery of said flight, and the remaining of said pockets at different radii relative to each other and to said first and last pockets; and further arranging each of said pockets at different vertical elevations along said flight;

forming said flight from a disk having a central aperture and a radial cut extending from said aperture to the outer peripheral edge thereof to form a leading edge and a trailing edge by forcing said edges apart, thereby forming at least a portion of said flight.

3,898,896

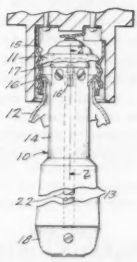
LIGHT BULB BASE EXTRACTOR

Laszlo Suhay, 1743 Payne, Findlay, Ohio 45840

Filed Sept. 16, 1974, Ser. No. 506,031

Int. Cl.[2] B25B *13/48*

U.S. Cl. 81—72 **4 Claims**



1. A light bulb base extractor, comprising a handle, an upper stem connected to the handle, a plurality of lamp base engaging pointed blades annularly disposed within the upper stem, and means for pivoting said pointed blades outwardly and downwardly with respect to said upper stem into a radially expanded position in engagement with the inner surface of a light bulb base so that as said blades engage the interior of the light bulb base, the upper stem of the extractor is pushed upwardly against the core of the light bulb base, said means comprising a threaded rotatable shaft within the upper stem, a rotatable knob connected to the shaft adjacent the handle, an internal spool within the upper stem in threaded engagement with the threads of the shaft, said blades being pivotally connected to the spool with the pivot axes of the blades tangential to a circle concentric with the rotatable shaft, and

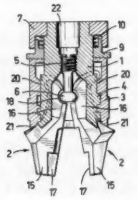
upper and lower guide means above and below each blade for causing the blades to pivotally retract into an upwardly inclined position when the spool is drawn downward by rotation of the knob and shaft in one direction and for causing the blades to pivot outwardly and downwardly toward a horizontal position when the spool is moved upward within the upper stem of the extractor during rotation of the knob and shaft in the opposite direction.

3,898,897

ADJUSTABLE SOCKET WRENCH

Toivo Untamo Jauhiainen, Hyvinkaa, Finland, assignor to SKF Industrial Trading and Development B.V., Jutphaas, Netherlands

Filed Apr. 26, 1974, Ser. No. 464,999
Claims priority, application Finland, Apr. 26, 1973, 1329/73
Int. Cl.[2] B25B *13/32*
U.S. Cl. 81—114 **5 Claims**



1. In an adjustable socket wrench having a substantially vertical head which is substantially circular in cross section, at least two gripping jaws symmetrically disposed with regard to the vertical axis of the head, each jaw having a protruding gripping portion, and an adjusting portion extending into the head and through a notch provided in said head, and an adjusting socket surroudning the head and the adjusting portions of the gripping jaws, said socket being mounted on the head so as to be vertically movable thereon, an improvement comprising a guiding device mounted on the vertical axis of the head and pivotably supporting the adjusting portions of said gripping jaws, said adjusting portions of the jaws having outer surfaces which are substantially concave, said adjusting socket including means for contacting said concave surface of each jaw to adjust the size of the jaws of the socket wrench by relative vertical movement of said adjusting socket with respect to said head to cause the gripping jaws to pivot around said guiding device.

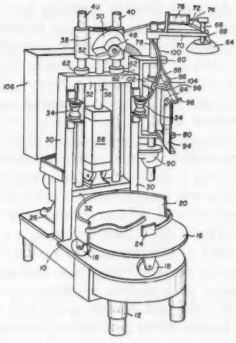
3,898,898

METHOD AND APPARATUS FOR OPENING BARRELS

Anthony R. Peres, Bristol, N.Y., assignor to Peres Electronic Machines, Inc., Bristol, N.Y.

Continuation-in-part of Ser. No. 364,055, May 25, 1973, abandoned. This application Dec. 17, 1973, Ser. No. 425,108
Int. Cl. B23b *1/00*
U.S. Cl. 82—47 **9 Claims**

1. A barrel opening method comprising:
a. securing said barrel on a rotatable stand;
b. lowering a guide roller and cutter wheel assembly into engagement with the rim of the cover for said barrel;
c. using low pressure air to bring said cutter wheel into contact with the outer lip of said cover rim outside the wall of said barrel;
d. rotating said stand to rotate said barrel with said guide rollers riding on both the inside and outside said cover rim;
e. using high pressure air for driving said cutter wheel radially inward into said outer lip of said cover rim as said barrel is rotating to cut through said outer lip to the outside of said barrel wall; and
f. removing said cover.

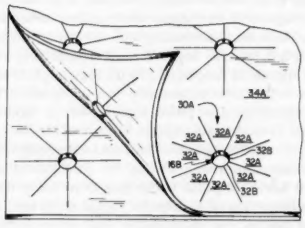


3,898,899

METHOD OF MAKING PACKAGE LINERS HAVING STARBURST PATTERNS CUT THERETHROUGH

David Weinstein, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Division of Ser. No. 389,619, Aug. 21, 1973, abandoned. This application Nov. 7, 1974, Ser. No. 521,799
Int. Cl. B26d *7/06*
U.S. Cl. 83—29 **1 Claim**

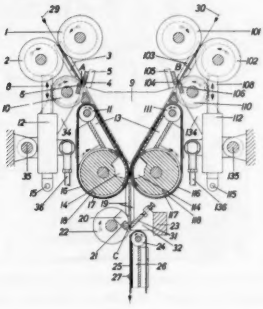


1. A method of making package liners for fragile articles, said package liners having starburst patterns cut therethrough comprising the steps of:
providing a cutting means including a substantially centrally located cutting edge having a closed arcuate shape and a plurality of additional straight cutting edges extending radially from said centrally located cutting edge;
disposing a plurality of contiguous layers of sheet stock in alignment with said cutting means;
actuating said cutting means to pass said cutting edges through all of said contiguous layers of sheet stock; and
separating said contiguous layers of sheet stock to form package liners having starburst patterns cut therethrough.

3,898,900
WEB CUTTING DEVICE

Alfred Schmermund, 62 Kornerstrasse, 5820 Gevelsberg, Germany

Filed Oct. 26, 1973, Ser. No. 410,156
Claims priority, application United Kingdom, Oct. 31, 1972, 50094/72
Int. Cl. B26d *7/06, 1/56*
U.S. Cl. 83—152 **7 Claims**



1. A web feeding and cutting device comprising, in combination:

first guide means to define a first web feed path;

second guide means to define a second web feed path having a portion thereof in common with said first path;

first web feeder means selectably operable to feed a first web along said first path;

second web feeder means selectably operable to feed a second web along said second path, said first and said second feeder means being actuatable alternately one with another;

main rotary cutter means disposed in said common feed path portion to sever blanks of predetermined length from a web fed along the respective one of said feed paths;

first auxiliary cutter means disposed in said first feed path; second auxiliary cutter means disposed in said second feed path, said first and said second auxiliary cutter means each comprising a first member angularly displaceable relative to a second member to bring mutually co-operable knife elements of said first and second members into co-operative action, said first and said second auxiliary cutter means each being located at equal distances upstream of the main cutter means along the respective feed paths and each of said auxiliary cutter means being spaced apart from said main cutter means along the respective one of said feed paths by a distance less than said predetermined length, whereby on the web fed along one of said feed paths being severed by operation of the respective one of said auxiliary cutter means, the resulting cut blank is fed along said common portion without the trailing end portion of said blank being engaged by said main cutter means.

3,898,901
LOG SEPARATION SYSTEM

Donald D. Savage, 2883 Cobb St., Marietta, Ga. 30060

Filed July 27, 1973, Ser. No. 383,116
Int. Cl. B23d *25/12*
U.S. Cl. 83—343 **2 Claims**

1. A mechanism for individually separating logs including:

a supply bin having an inclined floor in which the pile of logs is supported and along which the logs are moved under gravity, said floor having a discharge opening at its lower portion; and,

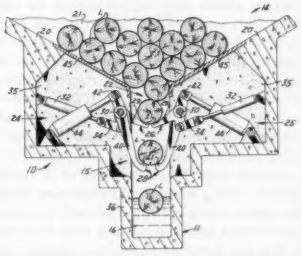
separation gate means for selectively closing said discharge opening and for individually releasing logs from the pile through said opening, said separation gate means comprising:

a first pair of arms positioned on opposite sides of said opening and selectively movable toward and away from each other to a first position blocking said opening and to a second position not blocking said opening so that the logs may individually pass therebetween,

a second pair of arms positioned on opposite sides of said opening below said first pair of arms selectively movable toward and away from each other to a third position blocking said opening to support a log thereon below said first pair of arms and to a fourth position not blocking said opening to release the log,

first drive means for selectively positioning said first pair of arms in said first position and in said second position, a second drive means for selectively positioning said second pair of arms in said third position and in said fourth position, and

control means operatively connected to said first and said second drive means for actuating said first and second drive means, said control means including sensing means for detecting movement of the major diameter of one of the logs carried by said second pair of arms past a prescribed point and for actuating



said first drive means to cause said first pair of arms to be moved from said second position to said first position upon passage of the major diameter of the log carried by said second pair of arms past said prescribed position;

a water flume located under said discharge opening for receiving and floating logs received from said separation gate means and wherein said control means further includes trip gate means constructed and arranged to be operated by a log carried in said water flume under said separation gate means, said trip gate means operatively connected to said second drive means for preventing movement of said second pair of arms from said third position to said fourth position when the log carried by said water flume is located under said separation gate means;

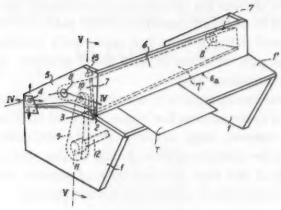
a conveyor operatively associated with said water flume for transporting a log from said water flume, said conveyor including means for locating the log in said flume at a prescribed position on said conveyor; and,

a severing means operatively associated with said conveyor for transversely cutting each log on said conveyor into prescribed shorter equal lengths, said severing means synchronized with said conveyor.

3,898,902
ROCKING ACTION SHEARING APPARATUS WITH CLAMPING MEANS

Paul Cailloux, Le Perreux, France, assignor to Promecam Sisson-Lehmann, Saint-Denis, France

Filed Jan. 30, 1975, Ser. No. 545,592
Claims priority, application France, Feb. 7, 1974, 74.4062
Int. Cl.[2] B23D *31/00, 33/02;* **B26D** *7/04*
U.S. Cl. 83—378 **10 Claims**



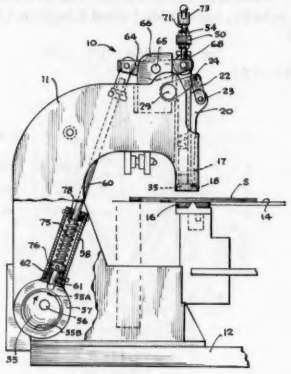
1. A rocking action shearing apparatus for shearing metal plates or the like, comprising support means adapted to support a plate to be sheared; a stationary blade fixed to said support means and arranged to be located on one side of a plate supported on said support means; clamping means mounted on said support means for rocking movement about a first fixed axis between an inactive position and a clamping position in which it clampingly engages the plate on the other side thereof; movable blade means comprising a second blade having a cutting edge which includes in a vertical plane an angle with the cutting edge of said stationary blade, said movable blade means being mounted on said clamping means for rocking movement about a second axis transversely spaced from said first axis between an inactive position and a shearing position in which said second blade engages a plate on said support means on the other side thereof and cooperates with said fixed blade to shear the plate; and means connected to said movable blade means for moving the latter between the positions thereof and said clamping means from said inactive to said clamping position.

3,898,903
TRIMMING MACHINES

Raymond I. Bulka, Oak Lawn, Ill., assignor to McCain Manufacturing Corporation, Chicago, Ill.

Filed Nov. 2, 1973, Ser. No. 412,490
Int. Cl. B26d *7/02*
U.S. Cl. 83—387 **5 Claims**

1. In a trimming machine for trimming paper sheets, signatures and like material, a reciprocal knife holder having a trimming knife mounted thereon, means to reciprocate the knife holder along a vertical axis to move the knife through a predetermined horizontal cutting plane, a reciprocal clamp disposed beneath the knife holder and guided by the knife holder for clamping the material to be trimmed, spring means for driving the clamp in one direction independently of the knife holder, cyclically operable means for driving said clamp independently of the knife holder in the opposite direction, said cyclically operable means including an eccentric which is adjustable to time operation of the clamp to the knife holder, a strap on the eccentric to be reciprocated thereby, a rod connected to the strap, the connection between the rod and

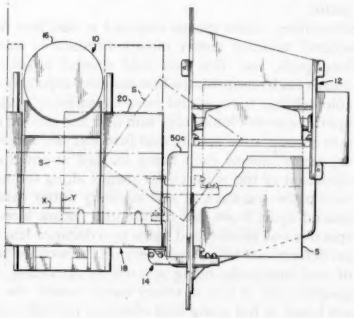


strap including a lost motion spring, and means for imparting reciprocation of said rod to said clamp.

3,898,904
SHEARING APPARATUS AND SHEET TRANSFER MECHANISM

Dennis Daniels, Bellevue, Wash., assignor to U.S. Amada, Ltd., Seattle, Wash.

Filed Sept. 4, 1973, Ser. No. 393,891
Int. Cl. B26d *5/00, 7/20*
U.S. Cl. 83—404.2 **12 Claims**

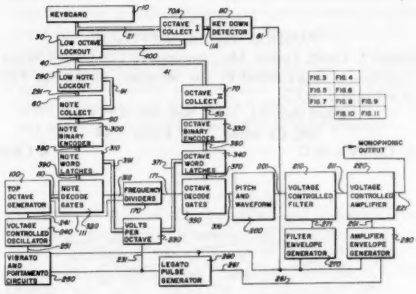


1. Shearing apparatus comprising a base, sheet supporting means on said base having a forward end, sheet cutting means including a shear punch and die, each having opposite ends, means for moving said shear punch past said sheet supporting means for shearing a sheet, an upper frame on said base, means for supporting said opposite ends of said shear punch and die between said upper frame and said base, said upper frame having opposite ends attached to said base, a side opening in one of said opposite ends of said upper frame partially aligned with said shear punch and die and exposed to said one of said ends of said shear punch and die so that a sheet can be moved laterally between the shear punch and die onto said sheet supporting means.

3,898,905
MONOPHONIC ELECTRONIC MUSICAL INSTRUMENT

Wilford Rayburn Schreier, Bensenville, Ill., assignor to Hammond Corporation, Chicago, Ill.

Filed Mar. 4, 1974, Ser. No. 447,905
Int. Cl. G10h *1/00, 5/06*
U.S. Cl. 84—1.01 15 Claims



1. In a monophonic electronic musical instrument:

a plurality of selectably actuable control elements for producing control signals on note busses, each control signal element being associated with one note of the musical scale;

encoder circuit means for encoding control signals on said note busses into a binary word;

memory means for storing said binary word;

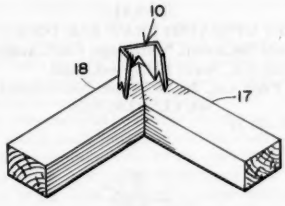
tone signal generating means for generating tone signals corresponding to notes of the musical scale; and

decoder circuit means for decoding said stored binary word to gate a tone signal corresponding to said stored binary word.

3,898,906
STRADDLE FASTENING DEVICE

Gerald H. Greenberg, 8301 S.W. 27th Ter., Miami, Fla. 33155

Filed Jan. 16, 1974, Ser. No. 433,852
Int. Cl.[2] F16B *15/00*
U.S. Cl. 85—11 2 Claims

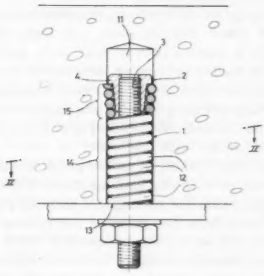


1. A straddle fastening device for joining abutting wood members and the like comprising a substantially rectangularly shaped body member having side edge portions, leg members extending along said side edge portions, said body member and said leg members having a leading edge portion and a trailing edge portion, said leading edge portions extending at substantially right angle from said body member and said trailing edge portions extending at substantially an acute angle with said body member, substantially V-shaped notches formed in leading edges of said body member and said leg members, said notches having sharpened edge portions for cutting into said abutting wood members and forming a substantially U-shaped slot for receiving said fastening device, a free end of said trailing edge portions of said leg members being out of coplanar relation with said leading edge portions and extending in a direction toward each other, said leg members being substantially equally spaced at their junction with said body member for providing a substantially vertical disposition for said juncture, whereby said fastening device is received in said slot formed in said wood member and said free ends of said trailing edge portions exert a yieldingly force in said slot directing the abutting members in a direction toward each other.

3,898,907
EXPANSION ANCHOR

Artur Fischer, Altheimer Strasse 219, D-7241 Tumlingen, Germany

Filed Apr. 13, 1973, Ser. No. 350,892
Claims priority, application Germany, Apr. 26, 1972, 2220422
Int. Cl.[2] F16B *13/06*
U.S. Cl. 85—64 5 Claims

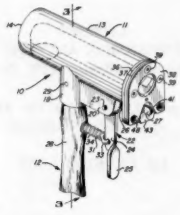


1. An expansion anchor, particularly for use in a concrete support structure having an exposed surface and provided with a hole having an open end in the region of the exposed surface and extending beyond the same and into the support structure, comprising a partly expandable tubular element consisting of a helical wire spring having adjacent convolutions, and extending from one end of said partly expandable element to the other end thereof, said helical wire spring having a leading end portion and a trailing end portion and being adapted to be inserted into the hole of the support structure so that said leading end portion is remote from, and said trailing end portion is closer to, the open end of the hole; means for permanently interconnecting only the convolutions of said trailing end portion so as to prevent these convolutions from conducting any movement with respect to one another radially and circumferentially of said spring; an expander element adapted to be inserted into said leading end portion; and an actuating element for drawing said expander element into said leading end portion and in direction toward said trailing end portion, whereby said expander element exerts expansion forces on all convolutions of said spring so that the convolutions of said leading end portion expand and anchor said leading end portion in the hole, while the convolutions of said trailing end portion are prevented from expanding by said interconnecting means so that the support structure in the region of the hole adjacent the open end of the latter is unaffected by the expansion whereby damage to said support structure in said region is avoided.

3,898,908
INERTIA BULLET PULLER

Robert H. Isenhower, deceased, late of Phoenix, Ariz., by Bonnie J. Isenhower, executrix, and David M. Garman, both of 4838 N. 29th St., Phoenix, Ariz. 85016

Filed Aug. 8, 1973, Ser. No. 386,771
Int. Cl.[2] F42B 33/10
U.S. Cl. 86—1 A 8 Claims



1. An inertia affected hammer like cartridge disassembling device comprising:

a cylindrical body portion and a handle portion extending laterally from said body portion,

said body portion having a hammer head at one end, a cartridge gripping means at the other end, and a bore, the axis of which extends along the longitudinal axis and through at least a part of said body portion from said gripping means to a point between its ends where said bore opens outwardly of said body portion,

said cartridge gripping means comprising an apertured plate mounted on said other end of said body portion with its aperture in line with said bore,

a slidable plate slidably mounted between said other end of said body portion and said apertured plate,

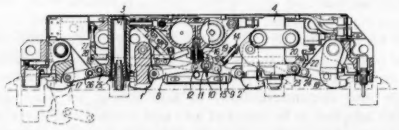
and trigger means for biasing said slidable plate toward the axis of said bore for gripping the casing of a cartridge inserted with its bullet end into said bore,

said trigger means connected to said slidable plate for biasing said plate toward the axis of said bore and when pressure is applied to it by the hand of a user biasing said slidable plate away from the longitudinal axis of the bore.

3,898,909
EJECTOR RELEASE UNIT FOR USE IN AIRCRAFT

Samuel W. Craigie, Maidenhead, England, assignor to M. L. Aviation Company Limited, Slough, England

Filed Mar. 4, 1974, Ser. No. 447,812
Claims priority, application United Kingdom, Mar. 5, 1973, 10474/73
Int. Cl. B64d 1/12
U.S. Cl. 89—1.5 F 2 Claims

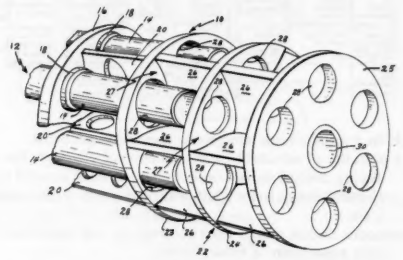


1. In an ejector release unit for releasing and projecting a store from an aircraft, a pair of telescopic ejection guns for projecting said store from said aircraft and a releasable latching mechanism for supporting said store, said latching mechanism including an inner pair of hooks mounted for pivotal movement and located between said ejection guns and first links connected to said inner hooks for swinging them from their operative positions, a central toggle mechanism controlling said first links, and an outer pair of hooks mounted for pivotal movement and located outside said ejection guns, a second link connected to each said outer hook, each of said second links being connected to a separate toggle linkage to hold each of said outer hooks in its operative position, each of said separate toggle linkages being controlled by said central toggle mechanism and each of said second links being so located in a lateral direction so as to pass to one side of said respective ejection gun.

3,898,910
PADDLE WHEEL DIFFUSER

Richard T. Groff, Ladue, Mo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 11, 1973, Ser. No. 423,856
Int. Cl. B64d 7/02; F41d 7/04
U.S. Cl. 89—14 C 6 Claims

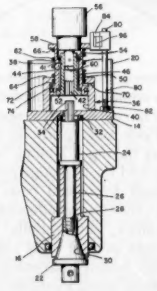


1. A device for deflecting a gun blast from an aircraft mounted gun having a plurality of rotatable barrels comprising a supporting structure secured to said gun barrels, a plurality of plates fixedly secured to said supporting structure, each of said plates having a plurality of apertures therein to permit said barrels to pass therethrough and a plurality of curved separator baffles located perpendicular to and interposed between said plates forming a plurality of chambers within said device which allows said gun blast to escape therefrom, each of said chambers encompassing the gun blast from a single barrel and in addition permits said gun blast to impart an added torque to said rotatable gun barrels.

3,898,911
REMOTELY OPERATED DRAW BAR TOOL CHANGER

David Edward DeCaussin, Northridge, Calif., assignor to Fadel Engineering Co., North Hollywood, Calif.

Filed Aug. 26, 1974, Ser. No. 500,443
Int. Cl.[2] B23C 5/26
U.S. Cl. 90—11 D 8 Claims



1. A machine tool having a draw bar located in a machine head and adapted to be connected to a tool holder at one end

and to a remotely operated spindle at the other end for rotating said draw bar comprising:

one end of said spindle and said other end of said draw bar having interengaging means,

means for moving said spindle in an axial direction from a non-interengaging position with respect to said draw bar to an interengaging position,

means for automatically and slightly rotating said spindle as said spindle is moved from said non-interengaging position and before reaching said interengaging position with said draw bar, and

means for automatically and fully rotating said spindle upon said spindle being interengaged with said draw bar whereby said tool holder is tightened or loosened depending upon the direction of rotation of said spindle.

3,898,912

PNEUMATIC ACTUATORS

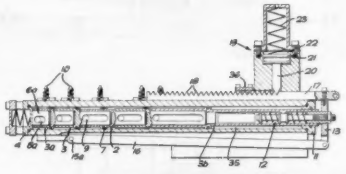
Peter Wills, 32 Beacon Hill, Lingfield, and Zygmunt Pudlo, 117 Three Bridges Rd., Crawley, both of England

Filed Aug. 30, 1973, Ser. No. 392,997

Claims priority, application United Kingdom, Sept. 7, 1972, 41618/72

Int. Cl. F01b *25/26, 31/12*

U.S. Cl. 91—1 **2 Claims**



1. In a pneumatic actuator having a double acting assembly of interconnected first pistons forming in a common chamber, a series of individually expansible chambers with independent, respective strokes and arranged to provide for an end connector a plurality of possible discrete positions differently spaced from a datum, a rack mounted for lengthwise movement with said end connector, said rack being provided with a plurality of teeth with recesses between said teeth, a plunger arranged to cooperate with the rack to secure the rack and end connector in at least some of the said positions, one end of the plunger being shaped for engagement with said recesses, a second piston for moving said plunger relative to the rack, to engage and disengage from the rack, and a plurality of valves for connecting selected ones of said chambers to an air supply, wherein the improvement comprises counter means including a first light source and a first photocell disposed adjacent said rack so that on opposite sides of the path of said teeth the illumination by the light source is interrupted by the passage of the teeth of the rack, thereby to cause said photocell to produce, when said rack is moved, an output having a number of successive interruptions, the number of interruptions providing an indication of the extent of movement of the rack.

3,898,913

SOLENOID CONTROL VALVE FOR HYDRAULIC BRAKE BOOSTER

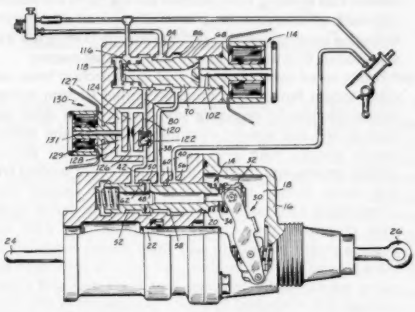
Richard T. Hendrickson; Richard L. Lewis; Jerome T. Ewald; Lloyd G. Bach, and George B. Hickner, all of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Sept. 24, 1973, Ser. No. 400,464

Int. Cl.[2] F15B *13/044, 13/04, 11/10*

U.S. Cl. 91—31 **5 Claims**

1. A vehicle hydraulic system comprising a pump, a hydraulic booster including a housing having an inlet port, an outlet port, and a return port, said housing defining a pressure chamber therewithin, operator-operated valve means shiftable from a first position communicating said pressure chamber with the return port and permitting substantially uninhibited fluid communication between the inlet port and the outlet port, said operator-operated valve means being shiftable to a second position when a booster actuation is effected wherein communication between the pressure chamber and said return port is terminated and the fluid pressure at the inlet port is communicated into the pressure chamber to actuate said booster, electrically operated valve means having a first port, first passage means communicating said first port to the low



pressure side of said pump, a second port, second passage means communicating said second port to said return port, a third port, third passage means communicating the third port to said inlet port, a fourth port, fourth passage means communicating said fourth port to the high pressure side of said pump, said electrically operated valve means being responsive to a signal to shift from a first position communicating said first port with said second port and said third port with with fourth port to a second position restricting communication between said third and fourth ports, blocking said first port, and communicating said second port with the fluid pressure level at said fourth port.

3,898,914

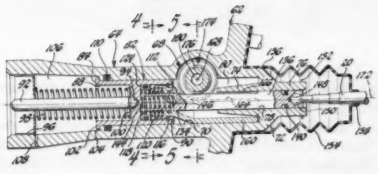
HYDRAULIC BRAKE BOOSTER ASSEMBLY

Ronald L. Shellhause, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed July 18, 1974, Ser. No. 489,497

Int. Cl.[2] F15B *9/10*

U.S. Cl. 91—375 R **4 Claims**



1. A hydraulic booster comprising:

a housing having an axially extending power section and a transversely extending valve section, and a bore in each of said sections, said bores having axes in skew relation and said bores intersecting each other;

a power piston reciprocably received in said power section bore and dividing said power section bore into a variable pressure power chamber and an unpressurized chamber, said housing including an apertured power section bore end wall closing said power chamber with said valve section bore intersecting said power section bore in said power chamber, with power piston having a valve friction

drive extension in said power chamber and formed with first friction drive surface means extending in a plane axially parallel to said power section bore axis and transversely parallel to said valve section bore axis;

an input control member extending reciprocably through said apertured end wall in sealing relation therewith and into said power chamber and having a friction drive section in said power chamber formed with second friction drive surface means extending axially parallel to said power section bore axis and transversely parallel to said valve section bore axis and in a plane parallel to and spaced from the plane of said first friction drive surface means; said housing valve section having parts connecting with said valve section bore in axially spaced relation and including ports adapted to be respectively connected with a source of hydraulic pressure and exhaust means;

and rotary spool valve means in said valve section bore, said valve means having first circumferential friction surface means frictionally engaging said first friction drive surface means and second circumferential friction surface means coaxial with said first circumferential friction surface means and frictionally engaging said second friction drive surface means, a plurality of spaced lands cooperating with said valve section bore to define therewith chambers respectively communicating with said ports, a center passage in said valve means communicating with said power chamber, and variable orifices in said valve means fluidly between said ports and said center passage and controlled by rotary movements of said valve means caused by linear movements of said power piston extension and said input control member to control the introduction and containment and removal of fluid pressure in said power chamber to actuate and hold and release the booster in accordance with movements of said input control member.

3,898,915

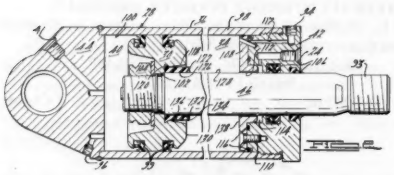
PISTON CYLINDER ASSEMBLY

Richard Neuman, Farmington, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 28, 1973, Ser. No. 345,826

Int. Cl. F15b *15/22*

U.S. Cl. 91—395 **7 Claims**



1. A fluid actuated piston cylinder assembly having a fluid supply passage and a fluid receiving passage, for use with a fluid circuit, comprising:

a housing having a body portion intermediate first and second end portions, the body and end portions defining together a cavity;

a piston within the cavity in sliding engagement with the body portion and dividing the cavity into first and second chambers, both chambers containing a fluid, the first chamber being partially defined by the first end portion; a rod connected to the piston and extending out of the cavity through the first end portion, the first end portion and the rod defining therebetween an annular passage adapted to be the sole communication between the first chamber and the fluid receiving passage; and

a resilient member encircling the rod and having a first end engaging the piston and a second end projecting away from the piston towards the first end of the housing, the circumferential portion of the second end of the resilient member being of a size to encompass the annular passage and having a surface area normal to the axis of said resilient member that varies along the axis of said resilient member from a relatively small surface cross-sectional area at said second end to the full cross-sectional area of said resilient member at an axial position intermediate said first and second ends thereby presenting a sealing surface when abutting the first end portion of the cylinder which is substantially smaller in cross-sectional area than the total cross-sectional area of said resilient member;

whereby when the piston approaches a position proximate the first end the resilient member seals the annular passage entrapping a quantity of fluid between the piston and the fluid end, thereby ensuring that a fluid pressure is maintained within the first chamber.

3,898,916

SUPERVISION OF SEVERAL ELECTRO-HYDRAULIC ACTUATORS OPERATING ON A COMMON OUTPUT

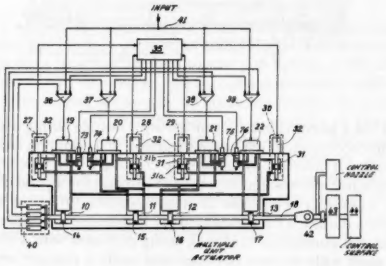
Eckhart Renner, Achim, and Udo Linnenbecker, Bremen, both of Germany, assignors to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Germany

Filed Apr. 4, 1974, Ser. No. 457,704

Claims priority, application Germany, Apr. 9, 1973, 2317754

Int. Cl.² F15B *11/22*

U.S. Cl. 91—411 R **16 Claims**



1. Apparatus for supervising an electro-hydraulic actuator system having a plurality of at least three individual piston-cylinder actuators, wherein the pistons are interconnected to operate on a common load, and each cylinder is pressure-controlled by a separate electro-hydraulic controller comprising:

comparator means connected to each of the cylinders of the plurality to compare the pressure in each of the cylinders of the plurality respectively with the pressure of at least two other cylinders of the plurality for obtaining a closed loop of comparisons, each resulting in an output and wherein at least two output signals indicate in each instance when operations of a piston of a cylinder actuator differs from the operation of the pistons of the other piston-cylinder actuators of the plurality; and

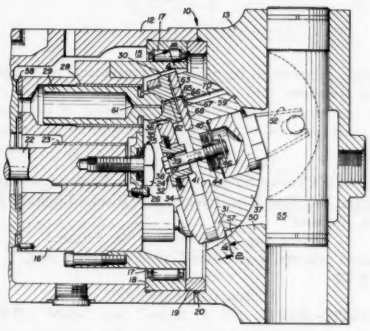
means connected to be responsive to the outut signals for obtaining control of the respective actuator to balance the operation of the respective cylinder or to shut it down in dependence upon the magnitude of the difference in operation as indicated by the output signals of the comparator means.

3,898,917

VARIABLE DISPLACEMENT FLUID TRANSLATING DEVICE

Cecil E. Adams; Ellis H. Born, and Gary C. Smith, Jr., all of Columbus, Ohio, assignors to Abex Corporation, New York, N.Y.

Filed Jan. 31, 1974, Ser. No. 438,311
Int. Cl. F04b *1/00*
U.S. Cl. 91—488 4 Claims



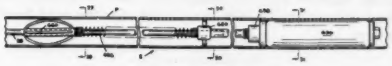
1. A variable displacement fluid energy translating device comprising: a body; a barrel rotatably mounted within the body; a plurality of cylinders formed in the barrel; a piston within each cylinder; a cam support in the body; a cam member mounted on the cam support and pivotable relative to the support; a swash plate having a top surface and a bottom surface and mounted on the cam member; a shoe pivotably attached to each piston adapted to slide on the top surface of the swash plate and reciprocate the piston within a cylinder when the barrel is rotated; means for pivoting the cam member from a position causing maximum fluid flow in one direction through the translating device to a position causing maximum fluid flow in another direction; a bore in each piston for conducting fluid under pressure in the cylinder through each piston to its shoe; a second bore in each shoe which feeds fluid from the piston through the shoe to a space between the bottom of the shoe and the top surface of the swash plate to hydraulically balance the shoe; a plurality of apertures in the swash plate for conducting fluid from the bottom of each shoe through the swash plate; a first collector port for collecting fluid under pressure from some of the swash plate apertures when the device is causing fluid flow in one direction, a second collector port for collecting fluid under pressure from other of the swash plate apertures when the device is causing fluid flow in the other direction, the first and second collector ports being isolated from one another, a third bore in the cam member for conducting fluid from the first collector port through the cam member; a first pocket on the back of the cam member connected to the third bore for receiving the fluid from the first collector port; a fourth bore in the cam member for conducting fluid from the second collector port through the cam member; a second pocket on the back of the cam member connected to the fourth bore for receiving fluid from the second collector port; wherein the fluid under pressure in one of the first and second pockets substantially reduces the friction between the cam member and the cam support and applies a force on the cam member which resists the force applied by the pistons on the swash plate.

3,898,918

DEVICE FOR TEMPORARILY PROVIDING A SEAL WITHIN AN ADVANCING PIPE

J. Warne Carter, Wichita Falls, Tex.

Division of Ser. No. 243,991, April 14, 1972, which is a division of Ser. No. 824,153, May 13, 1969, Pat. No. 3,700,519, which is a continuation-in-part of Ser. No. 577,035, Sept. 2, 1966, Pat. No. 3,507,412, which is a continuation-in-part of Ser. No. 387,372, Aug. 4, 1964, abandoned. This application Oct. 23, 1973, Ser. No. 408,790
Int. Cl. F16j *3/00*
U.S. Cl. 92—92 2 Claims



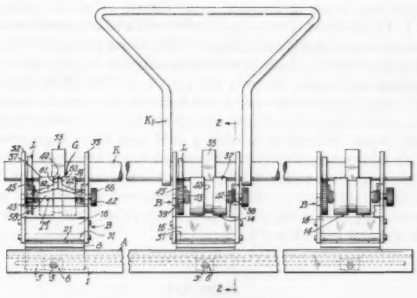
1. A device for temporarily providing an air seal within an advancing pipe comprising a first air conveying tube adapted to extend through the pipe, a rigid perforated sleeve connected to a second air conveying tube in communication with the interior of said sleeve, the second tube being in communication with and connected to the first tube to allow longitudinal movement of the second tube and the sleeve relative to the first tube, an inflatable container secured to surround the sleeve, said container when inflated gripping the inner surface of the pipe and movable therewith, and extensible means for returning said second tube, sleeve and associated inflatable container upon deflation of the container.

3,898,919

SHEET PERFORATOR HAVING MEANS FOR REINFORCING THE SHEET AT THE HOLES

David Grimaldi, Jr., 458 George St., Ridgewood, N.J. 07450

Filed Dec. 28, 1973, Ser. No. 429,361
Int. Cl. B26f *1/02*; B31f *5/08*
U.S. Cl. 93—1 A 8 Claims



1. The combination of a support frame, means on said frame for rotatably supporting a supply roll of tape having pressure-sensitive adhesive on one side, means for feeding said tape step-by-step including a feed roller to which said tape separably adhesively adheres and having stub shafts at its end rotatably mounting said roller in said frame, means to rotate said roller step-by-step including a feed gear rotatable on one of said stub shafts, a drive shaft rotatably mounted in said frame, a gear quadrant keyed on said drive shaft and meshing with said feed gear so as to rotate said feed gear alternately in opposite directions upon oscillation of said drive shaft, and oppositely wound helical torsion springs each mounted on one stub shaft in frictional contact therewith, one spring having an offset end extension and said feed gear having an arcuate slot into which said offset end extends so that the feed gear has a limited degree of rotation in each direction without contact of the slot ends with said offset end extension, said springs being arranged to tighten on and grip the shaft and rotate said feed

roller in the direction to pull the tape from said roll upon engagement of one end of slot with said offset end extension and said spring being released from said shaft upon rotation of said gear in the opposite direction, and the other spring having an offset end extension secured in said frame and the spring being arranged to tighten on and grip its stub shaft upon rotation of said feed gear in said opposite direction and thereby hold the feed roller against backward rotation, said drive shaft and said gear quadrant being normally disposed in a neutral position and rotatable firsly in the direction to actuate the feed roller to feed a predetermined length of tape, and secondly in the opposite direction while the feed roller is held stationary against rotation and thirdly back to neutral while the feed roller remains stationary ready for the next feeding movement.

3,898,920

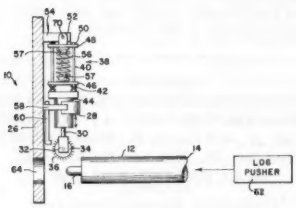
TAIL TIE SYSTEM

Jerry Zucker, Lake Como, Fla., assignor to Hudson Pulp & Paper Corporation, Palatka, Fla.

Filed Feb. 15, 1974, Ser. No. 442,830

Int. Cl.[2] B65H *75/28;* **B31F** *5/02*

U.S. Cl. 93—1.1 **11 Claims**



1. The method of securing the free tail end of paper on a roll comprising engaging a portion of the surface of said tail end of paper with a plurality of individual pins, urging said pins against said paper towards the center of the roll to depress individual areas of the paper roll beneath said pins for several layers of paper, thereby to spread the fibers of said paper in said areas; thereafter removing said pins from engagement with said paper, whereby said spread fibers interlock to hold said layers of paper together; and wherein said pins are mounted on a roller and said engaging step includes the step of moving said roller along the surface of said roll parallel to the central axis of said roll.

3,898,921

AIR NOZZLE FOR VENTING SYSTEMS

Hans Trube, Sindelfingen; Hermann Grimm, Ostelsheim, and Gernot Karioth, Sindelfingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

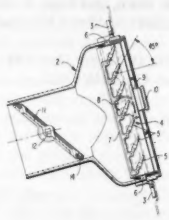
Filed Oct. 27, 1972, Ser. No. 301,293

Claims priority, application Germany, Oct. 28, 1971, 2153743

Int. Cl. F24f *13/06*

U.S. Cl. 98—40 A **38 Claims**

1. An air nozzle for a ventilating installation, which includes an adjustable shutter means, characterized in that a housing means having an inlet and discharge aperture is provided, adjustment means for adjusting the shutter means, the shutter means is accommodated in the discharge aperture of the housing means, the housing means includes an air valve means disposed in said housing between the inlet and the shutter means for regulating the air quantity discharged from the air nozzle, valve control means operatively connected with said air valve means for opening and closing the same, said valve control means includes an actuating member disposed at the discharge aperture, and means for slidably mounting said



actuating member to be movable transversely to the air discharge aperture.

3,898,922

DEODORISATION UNIT

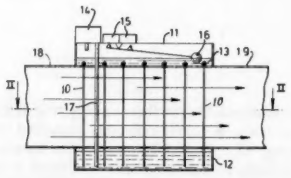
Jack Mark Charles Savage, Abingdon, England, assignor to Burger Boy Red Top Refreshment Kiosks Limited, Abingdon, England

Filed Aug. 2, 1973, Ser. No. 385,063

Claims priority, application United Kingdom, Aug. 7, 1972, 36719/72

Int. Cl. F23j *11/08*

U.S. Cl. 98—115 R **8 Claims**



1. A deodorisation unit comprising ducting through which fumes to be deodorised are forced, an upper fluid reservoir for containing deodorising fluid mounted above the ducting, a lower fluid container for surplus deodorising fluid mounted oppositely below the ducting, a plurality of absorbent wicks extending from said reservoir across the ducting in the direct path of said fumes and into said container, said wicks being arranged in staggered rows to ensure good mixing of the fumes and the deodorising fluid vapour evaporating from the wicks, a pump having an inlet connected to said container and an outlet connected to said reservoir and means for periodically actuating said pump for transferring fluid from said container to said reservoir.

3,898,923

SAFETY TABLE FOR A SKINNING MACHINE

Charles Austin Greider, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Nov. 29, 1973, Ser. No. 420,266

Int. Cl. A22b *5/16*

U.S. Cl. 99—589 **1 Claim**

1. In combination,

a skinning machine having a frame means with a top portion, and forward and rearward ends, opposite sides, and a skinning blade mounted on said frame means,

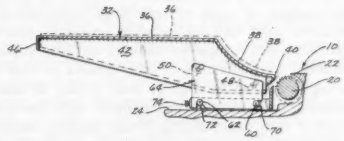
a safety table means secured to said skinning machine adjacent the forward end of said skinning machine,

said safety table means comprising a forward table portion disposed in a plane above said skinning blade and a rearward table portion extending downwardly and rearwardly from the rearward end of said forward table portion

towards said skinning blade, said rearward table portion being arcuate, said safety table having opposite sides,

mounting means securing said safety table means to said skinning machine,

said skinning machine having first and second pairs of spaced apart pins extending horizontally inwardly from opposite sides thereof towards said safety table means,



said mounting means comprising a first mounting bracket secured to one side of said safety table means and a second mounting bracket secured to the other side of said safety table means,

said first mounting bracket being selectively detachably secured to said first pair of pins,

said second mounting bracket being selectively detachably secured to said second pair of pins.

3,898,924

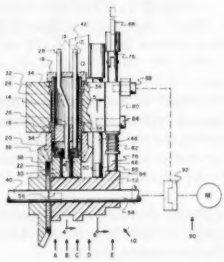
TYING MACHINE

Stanley L. Mead, and Gerald G. Dilley, both of Portland, Oreg., assignors to Stanley L. Mead, Portland, Oreg.

Filed Aug. 12, 1974, Ser. No. 496,719

Int. Cl. B65b *13/28*

U.S. Cl. 100—12 **7 Claims**



1. An improved tying machine having selectively openable and closeable loop-forming means for forming a length of tying tape into a loop around an article to be tied, tape-feeding means for feeding said tape into said loop-forming means whereby a loop of tape is formed around said article, a first clamp means for clamping the leading end of said loop, means for tightening said loop around an article to be tied, a second clamp means for clamping a trailing portion of said tape forming said loop, knife means for severing said loop from the remainder of said tape, and twister means for twisting the ends of said loop together to secure said article, wherein the improvement comprises three push-member assemblies mounted in said machine, each engaging at one end thereof said first clamp means, said second clamp means and said knife means respectively, for independently actuating said respective clamp and knife means, and a cam means rotatably mounted in said machine adjacent the opposite ends of said respective push-member assemblies for actuating said clamp means and knife means, said cam means having three respective lobes distributed axially and peripherally over its exterior surface for sequentially displacing each of said push-member assemblies solely by the direct application of compressive force thereto in response to the rotation of said cam means.

3,898,925

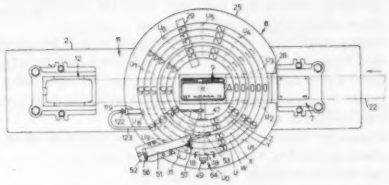
DIE EMBOSSING APPARATUS

Donald R. Alexander, R.R. 3 Box 291, Conway, Ark. 72032

Division of Ser. No. 296,602, Oct. 11, 1972, Pat. No. 3,824,921. This application Jan. 16, 1974, Ser. No. 433,819

Int. Cl. B44b *5/02*; **B41l** *47/44*

U.S. Cl. 101—18 **4 Claims**



1. A progressive die for working strip stock continuously into perforated, inscribed and serially numbered plate members, said die comprising an elongated base member, a perforating section at one end of said base member, a blanking section at the other end of said base member, and numeral embossing and inscription embossing sections intermediate said perforating and blanking sections; and said numeral embossing section including a flat concentric assembly of relatively rotatable decimal rings each having a circular series of consecutive digit embossing elements at the obverse side of the ring assembly; and an indexing mechanism at the converse side of said ring assembly operable to rotate said rings step by step in predetermined order so as to present said digit embossing elements thereof in successive serial number configurations.

3,898,926

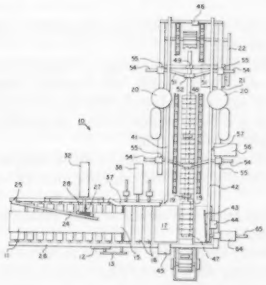
AUTOMATIC RANDOM CASE CODER

Anthony R. Peres, Bristol, N.Y., assignor to Peres Electronic Machines, Inc., Bristol, N.Y.

Filed June 17, 1974, Ser. No. 480,115

Int. Cl. B41f *17/26*

U.S. Cl. 101—37 **10 Claims**



1. An automatic random case coder comprising:

a. infeed means for advancing said cases into an input region of said coder, said infeed means having an output end;

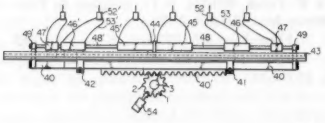
b. switch means for sensing the size of each of said cases advanced by said infeed means;

c. a brake in the region of said output end of said infeed means for successively holding each of said cases delivered by said infeed means;

d. an intermittently driven conveyor for advancing said cases through said coder;

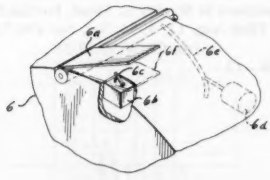
e. sensing means for sensing the initial movement of each of said cases on said conveyor;
f. said brake being responsive to said movement sensing means for releasing a held one of said cases to be pushed onto said conveyor by another one of said cases following said held case and advanced by said infeed means;
g. a pair of laterally adjustable side rails along opposite sides of said conveyor;
h. printing devices on said side rails for printing on said cases advanced by said conveyor;
i. means responsive to said size sensing means for applying said brake to hold any one of said cases differing in size from a preceding one of said cases and for operating said coder to clear said coder of all of said cases preceding said different size case;
j. means for sensing that said coder is cleared of all of said cases preceding said different size case;
k. an axially movable adjusting shaft;
l. means responsive to said clearing sensing means for positioning said shaft;
m. means controlled by the position of said shaft for laterally adjusting said side rails; and
n. means responsive to said adjustment of said side rails for releasing said brake to allow said different size case to be pushed onto said conveyor to advance through said coder.

3,898,927
ROLLING-TYPE MARKING MACHINE
Yuuji Murata, Tokai; Kuniaki Sato, Miyazu, and Sigeru Yonejima, Tokai, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Filed June 26, 1973, Ser. No. 373,784
Claims priority, application Japan, July 3, 1972, 47-66461; July 13, 1972, 47-70219; Dec. 22, 1972, 47-147555
Int. Cl.[2] B41J *1/32*
U.S. Cl. 101—110 **6 Claims**



1. Apparatus for marking indicia on a plate moving along a fixed path which comprises
a marking roll including an elongated central shaft having opposed ends, a plurality of toothed rings loosely mounted on said central shaft, the teeth on each of said rings carrying indicia punch means projecting from the outer periphery of said rings,
rotatable shaft means fixed to said central shaft and extending longitudinally from the opposite ends of said central shaft,
means for supporting said rotatable shaft means for rotation about a fixed axis,
means selectively engageable with the teeth on each of said rings for rotating each of said rings upon said central shaft to preset positions to align a selected tooth on each ring with selected ones on the others of said rings and thus present a desired line of punch indicia to be marked on said plate,
means for selectively locking said rings and a preset line of punch indicia carried thereby to said central shaft for rotative movement therewith, and
a pair of pinch rolls mounted concentrically on said rotatable shaft means for rotation therewith, the diameter of said pinch rolls being greater than that of said rings, the axis of said central shaft being disposed eccentrically of the axis of said fixed axis by a distance equal to one-half of the difference between the diameter of said pinch rolls and said rings whereby when said rings are locked to said central shaft and said rotatable shaft means is rotated only the preset line of punch indicia carried on said rings projects radially beyond the peripheral expanse of said pinch rolls for effecting marking on a plate moving in rolling contact with said pinch rolls,
the means for locking said rings to said central shaft comprising a locking member received in a groove in the outer surface of said central shaft, the inner circumferential surface of each of said rings being provided with notches, said locking member and said groove being provided with companion oblique surfaces, sliding of said member longitudinally of said groove in one direction being operative to urge at least a part of said locking member into locking engagement with the notches in each of said rings, sliding of said locking member in an opposite direction being effective to retract said locking member wholly within said groove.

3,898,928
MASTER SWITCH TO ACTUATE DAMPENER IN AUTOMATIC DUPLICATOR
Tamaki Kaneko, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Continuation of Ser. No. 105,926, Jan. 12, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,667
Int. Cl. B41l *25/16*
U.S. Cl. 101—132.5 **2 Claims**



1. In a lithographic offset printing machine for use with a plurality of discrete master sheets each having marking indicia thereon indicating the number of prints to be made from each of the discrete master sheets, the combination comprising:
a main cylinder for carrying said each of the discrete master sheets;
a transfer cylinder disposed in contiguous relation with said main cylinder for receiving an offset image from said each of the discrete master sheets;
a pressure cylinder disposed on contiguous relation with said transfer cylinder for pressing copy sheets against said transfer cylinder;
a master sheet feeding device to feed said each of the discrete master sheets to said main cylinder;
a clamp mounted on said main cylinder for retaining said each of the discrete master sheets thereon;
a switch on said main cylinder positioned to be engaged by a leading edge of each said master sheet fed to said main cylinder to thereby actuate said switch;
drive means on said main cylinder coupled to said clamp and responsive to actuation of said switch by said master sheet to close said clamp to thereby retain said master sheet on said main cylinder;
a moistening device for moistening said each of the discrete master sheets;
control means responsive to said actuation of said switch by said master sheet for producing a control signal when said master sheet is retained by said clamp;
means responsive to said control signal for operating said moistening device for moistening said master sheet retained in said main cylinder;
reading means disposed between said master sheet feeding device and said main cylinder to scan the marking indicia

on said each of the discrete master sheets and generating a first electrical pulse signal representing the number of prints to be made therefrom;

a memory device electrically connected to said reading means to store said first electrical pulse signal indicative of the number of prints to be made from said each of the discrete master sheets;

means for actuating an ink supply device to cause the application of ink and water to said each of the discrete master sheets after moistening;

copy sheet feeding means to feed the copy sheets to said pressure cylinder and including means for generating a second electrical pulse signal indicative of the number of copy sheets being fed to said pressure cylinder;

comparing means electrically connected to said memory device and said means for generating said second electrical pulse signal, said comparing means comparing said first and second electrical pulse signals and generating a completion signal when the value of said first electrical pulse signal equals that of said second electrical pulse signal;

means for actuating an image erasing device to remove the image from said transfer cylinder in response to the stopping of said copy sheet feeding means;

means for removing said each of the discrete master sheets from said main cylinder upon completion of printing; and control means operable by said completion signal to terminate operation of said copy sheet feeding means and to operate said removal means to remove said each of the discrete master sheets from said main cylinder, said control means being further operable to actuate said master sheet feeding means to feed a following individual master sheet to said main cylinder.

3,898,929

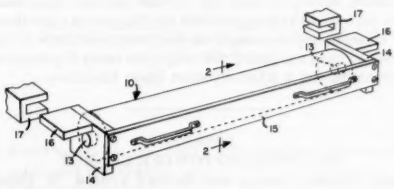
HICKEY PICKING DEVICE FOR LETTER PRESS OR OFFSET PRINTING PRESSES

Tor Arild, P.O. Box 4063, Woodside, Calif. 94062, and Thomas Gehres, 53 Mark Dr., San Rafael, Calif. 94903

Continuation of Ser. No. 418,097, Nov. 21, 1973, abandoned, which is a continuation of Ser. No. 262,647, June 14, 1972, abandoned. This application June 24, 1974, Ser. No. 481,992

Int. Cl. B41f *35/02, 41/02*

U.S. Cl. 101—147 **2 Claims**



1. The method of removing foreign particles which cause hickeys from the ink train of a conventional offset printing press or letter press which is provided with bracket members for supporting a wash-up tray adjacent to a hard surface roller of the ink train, said bracket members being accessible while the press is running, comprising the steps of:

removing the wash-up tray from the bracket members;

providing a hickey picking cylinder having a resilient surface and being rotatably supported in bracket means adapted to interfit with the bracket members of the press in a manner to hold the cylinder surface tightly against a hard surface roller of the ink train of the press, said hickey picking roller also being of a length at least equal to that of said hard surface roller and being adapted to rotate with the hard surface roller thereby allowing the resilient surface cylinder to remove foreign particles from said hard surface during running of said press in a normal printing operation, inserting the hickery picking cylinder bracket means in the bracket members of the press.

3,898,930

PRINTER FOR EMBOSSED CARD

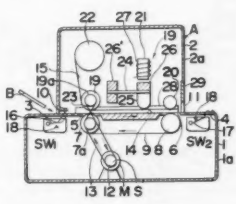
Yoshizo Ikegami, and Susumu Fukeda, both of Hyogo, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara-shi, Japan

Filed Nov. 8, 1973, Ser. No. 414,023

Claims priority, application Japan, Nov. 17, 1972, 47-115967

Int. Cl. B41f *1/28*

U.S. Cl. 101—316 **2 Claims**



1. In combination, a printer for a card having an embossed portion thereon, said printer comprising a housing structure including a horizontal top surface extending from one side to the other and forming a horizontal embossed card travel path, said housing structure including an inlet and an outlet opening in alignment with said top surface on respective sides of said housing structure, an endless conveyor belt rotatably trained over said top surface and extending from said inlet to said outlet opening, an electric motor operatively associated with said conveyor belt and energizable to transport an embossed card inserted within said inlet opening along said embossed card travel path for discharge at said outlet opening, a roll of paper mounted above said endless conveyor belt, a paper drive roller mounted below said roll of paper for rotation about an axis parallel to the axis of rotation of said endless belt, means operatively coupling said motor to said paper drive roller for unwinding said paper from said roll and for feeding said paper along said card travel path and overlying said card such that said card is conveyed to said outlet while sandwiched between the web of paper and the endless conveyor, a vibrating printer mounted within said housing structure above said paper web and downstream of said roll of paper, intermediate of said inlet and outlet, said vibrating printer including a stationary magnetic hammer coil and a vibrating hammer for contact with said paper web, a source of electrical current, a first normally open switch mounted adjacent to said inlet opening and responsive to card insertion for momentary closure, a second normally closed switch mounted adjacent to said outlet opening and responsive to card discharge for momentarily opening the switch contacts thereof, and a third normally open relay switch including normally open contacts and a relay coil for operating the same, and circuit means for electrically connecting said relay coil, said motor and said hammer coil in series with the source of electrical current and in parallel with each other, and parallel paths including said first switch, and said second and third switches respectively connecting said source to said relay coil, said motor and said hammer coil; whereby, insertion of said embossed card into said inlet opening causes said motor to be energized, said hammer coil to be energized, and said relay coil to be energized, effecting transport of said embossed card from said inlet opening to said outlet opening during which time said paper web is continuously fed, said vibrating hammer is continuously vibrating and whereupon, discharge of said embossed card automatically opens the holding circuit between the source of electrical energy, said relay coil, said

vibrating hammer coil, and said drive motor, terminating operation of said printer.

3,898,931

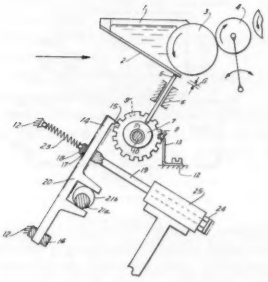
DOCTOR BLADE MULTIPLE-POINT CONTROL

Heinz Posselt, Leipzig, Germany, assignor to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, Germany

Filed Feb. 20, 1974, Ser. No. 444,246

Int. Cl. B41f *31/04*

U.S. Cl. 101—365 8 Claims



1. In a printing machine, a combination comprising a printing-ink receptacle having an elongated outlet; dispensing means, including an elongated flexible doctor blade extending along said outlet and defining a gap of predetermined maximum width which is elongated longitudinally of said doctor blade and through which printing ink is dispensed; and adjusting means for adjusting the width of said gap to thereby vary the amount of printing ink dispensed through the same, said adjusting means comprising a rotatable eccentric shaft extending along said doctor blade, a plurality of pressure-transmitting bars engaging said doctor blade at respective locations which are spaced therealong and each being individually shiftable transversely of said gap to flex the doctor blade and decrease the width of said gap, a plurality of turnable eccentric cams each associated with one of said bars for shifting the same transversely of said gap, drive means for rotating said eccentric shaft, and motion-transmitting means for transmitting motion from said shaft to selected ones of said cams so as to effect shifting of the bar which is associated with the same, so as to increase the width of said gap at some of said locations while at the same time decreasing its width at other locations if required and at the will of an operator.

3,898,932

NON-HAZARDOUS RING AIRFOIL PROJECTILE FOR DELIVERY OF NON-LETHAL MATERIAL

Abraham Flatau, 2003 Stockton Rd., Joppa, Md. 21085; Donald N. Olson, Atherton Rd., Lutherville, Md. 21093, and Miles C. Miller, 504 Haverhill Rd., Joppa, Md. 21085

Filed Nov. 29, 1972, Ser. No. 310,626

Int. Cl. F42b *13/46*, *11/32*

U.S. Cl. 102—66 9 Claims

1. In a projectile having an annular ring shape with a substantial tear drop airfoil cross-section defining a hollow interior and being defined by major annular inner and outer substantially curvilinear surfaces defining the diametric extent of said shape and being terminated by leading and trailing edges which define the longitudinal extent of said shape, the improvement comprising a non-lethal incapacitating payload disposed within the hollow interior of said projectile and being confined by an outer resilient structure forming said shape

further including rupturable means which ruptures upon impact with the target for disseminating said payload.

3,898,933

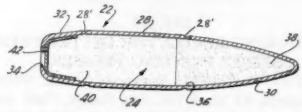
TRAINING BULLET FOR FIRE ARMS

Andre Castera, Creuzier-le-Vieux, and Pierre Lucaire, Vichy, both of France, assignors to Manufacture de Machines du Haut-Rhin S.A., Mulhouse-Cedex, France

Filed Mar. 21, 1973, Ser. No. 343,249

Int. Cl.[2] F42B *11/18*

U.S. Cl. 102—92.7 9 Claims



1. A training projectile for a firearm having a main body portion and a nose, comprising a metallic casing in one piece made of the same material and in the same form as the casing of the combat projectile, for such firearm, said training projectile casing having at least one annular thinned zone means which permits said casing to break into fragments upon impact with a target, and a mass of an inert composition in flowing powder form in the casing, the projectile being fractured into fragments having a relatively short range trajectory.

3,898,934

MULTISTRAND POWDER CHARGE

Jacques Mercier, Satory, and Bernard Lancon, St. Etienne, both of France, assignors to Republic of France, Paris, France

Filed May 10, 1973, Ser. No. 358,954

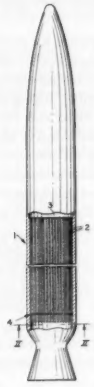
Claims priority, application France, May 12, 1972, 72.016943

Int. Cl.[2] F42B *1/00*

U.S. Cl. 102—100 13 Claims

1. Multistrand powder charge comprising a bundle of elongate rod-like individual powder strands fixed by one of their ends on a support so as to extend therefrom to their oppositely located free ends; internal bracing means in the heart of the bundle and in at least one region between the support and the free end of the powder strands, extending crosswise relative to and between the powder strands, for separating and holding the said powder strands fixedly relative to each other and such that each strand is separated from at least one adjacent strand by said internal bracing means, to allow a gaseous flow be-

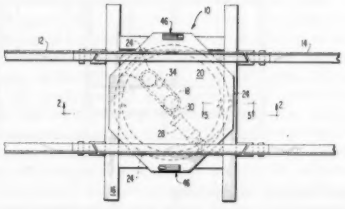
tween the said powder strands during the combustion of the charge and maintain the bundle as an integral unit, the separations between adjacent strands constituting open gas flow paths over at least the major part of the lengths of said strands.



3,898,935
CAR TURNER

Bruce Norlie, Durham, and Bernard G. Bradbury, Chico, both of Calif., assignors to Rexnord Inc., Milwaukee, Wis.

Filed Jan. 28, 1974, Ser. No. 437,082
Int. Cl. B60s *13/02*
U.S. Cl. 104—37 **10 Claims**



1. A car turner for the cars of a unit transportation system, said car turner comprising:

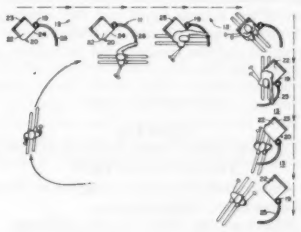
1. a stationary frame;
2. a rotatable pivot shaft mounted on said stationary frame;
3. a turntable mounted on said rotatable pivot shaft;
4. a first sprocket integrally mounted on said rotatable pivot shaft;
5. a second sprocket rotatably mounted on said stationary frame;
6. a first chain passing around said first and second sprockets so that, when one rotates, the other will also rotate;
7. a drive transmission block mounted on said first chain; and
8. a dual-action fluid cylinder mounted on said stationary frame, the rod of said dual-action fluid cylinder being connected to said drive transmission block,

whereby the linear motion of the rod of said dual-action fluid cylinder can be transmitted through said first chain and said rotatable pivot shaft to said turntable, causing said turntable to rotate back and forth.

3,898,936
SKI TRAM LOADING SYSTEM AND CARRIERS THEREFOR

Harvey G. Spencer, 1505 Birch, Richland, Wash. 99352

Filed Apr. 19, 1971, Ser. No. 135,242
Int. Cl. B61b *11/00*
U.S. Cl. 104—173 **8 Claims**



1. A loading system for ski trams having an overhead traction cable transiting about a course defined by plural sheaves supported upon plural spaced towers, comprising: a linear loading course wherein carriers are supported at boarding elevation a spaced distance above a skier supportative surface therebeneath for a distance sufficient to allow simultaneous, plural loading of skiers; and a loading area having a continuous conformably sloping skier supportative surface on at least one side of the loading course with the surface having a downward slope to the carrier course to allow each of a plurality of skiers to transport himself by skiing on the supporting surface to one of plural, spaced moving passenger carriers and move with the one carrier while entering it simultaneously with other skiers entering other carriers, with depending passenger carriers, comprising, in combination:

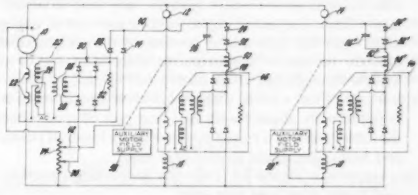
a passenger carrier arm fixedly communicating for support with the overhead transit cable and depending therefrom; and

at least one carrier seat to support a passenger fixedly positioned on the lowermost part of the carrier arm and angularly disposed laterally outwardly to the course of passenger carrier travel.

3,898,937
WHEEL SLIP SENSING AND CONTROL SYSTEM

Lauren L. Johnson, Westchester, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 19, 1973, Ser. No. 417,213
Int. Cl. B61c *15/12*
U.S. Cl. 105—61 **6 Claims**



1. A wheel slip detection apparatus for a vehicle having a plurality of traction motors adapted to drive separate traction wheels and having an electrical source for supplying an electrical output for operating the traction motors, the motors being electrically arranged in a plurality of parallel branches, and each branch containing a single motor or a plurality of motors in series, the apparatus including

means responsive to the electrical output for providing a source signal varying as a function of source current,

each branch having associated therewith means responsive to the motor current for providing a motor signal varying as a function of the motor current,

the source signal having a predetermined normal relationship with each motor signal during normal wheel operation,

and means associated with each branch and responsive to a function of the source signal and the respective motor signal for detecting an abnormal relationship between the source signal and the motor signal indicative of slipping of a wheel.

3,898,938

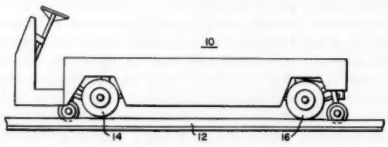
DUAL MODE ELECTRIC VEHICLE FOR ROAD OR RAIL TRACK OPERATION

Charles W. Poole, Redlands, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 20, 1973, Ser. No. 417,644

Int. Cl.[2] B61F *13/00*

U.S. Cl. 105—215 C **3 Claims**



1. An electric vehicle operable on roadbeds and on rail tracks comprising:

a front pair of road wheels disposed toward the front of the electric vehicle;

a rear pair of road wheels disposed toward the rear of the electric vehicle;

a front axle supporting said front pair of road wheels;

a rear axle supporting said rear pair of road wheels;

a frame for supporting the body of the electric vehicle;

front suspension means for resiliently supporting a portion of said frame from said front axle;

a front set of rail wheels, disposed in close proximity to and longitudinally aligned with said front pair of road wheels, movable between a raised position and a lowered position and being connected to said front axle;

front operation means for raising and lowering said front set of rail wheels;

said front rail wheels being connected to said front axle so that when operating on rails with said front set of rail wheels lowered in contact with the rails said front set of road wheels are raised slightly above and out of engagement with the rails and a portion of the weight of the electric vehicle is supported by said front set of rail wheels through said front suspension means;

a rear pair of rail wheels, disposed in close proximity to and longitudinally aligned with said rear pair of road wheels, movable between a raised position and a lowered position and being connected to said rear axle;

rear suspension means for resiliently supporting a portion of said frame from said rear axle;

rear operating means for raising and lowering said rear set of rail wheels;

said rear set of rail wheels being connected to said rear axle so that when operating on rails with said rear set of rail wheels lowered and in contact with the rails said rear set of road wheels also contact said rails;

drive motor means connected to said rear pair of road wheels for moving the electric vehicle on roadbeds and on railway tracks;

a rigid front subassembly lifting frame pivotally mounted to said front axle and having said front pair of rail wheels attached thereto;

a rigid rear sublifting frame pivotally attached to said rear axle and having said rear pair of rail wheels attached thereto;

said front operating means for raising and lowering said first set of rail wheels comprises a single front linear operator connected to said front subassembly lifting frame to pivot said front subassembly lifting frame around the pivotal connection to said front axle thereby raising and lowering said front pair of rail wheels along an arcuate path;

said second operating means comprises a single rear linear actuator connected to said rear subassembly lifting frame for pivoting said rear subassembly lifting frame about the pivotal connection to said rear axle to raise and lower said rear set of rail wheels along an arcuate path;

said front suspension means comprises leaf springs with both ends connected to said frame and intermediate the ends connected to said front axle; and,

said rear suspension means comprises leaf springs; and including a radial arm pivotally connected at one end to said front axle and connected at the respective opposite end to said frame in approximate alignment with one end of the leaf springs.

3,898,939

SHELF ASSEMBLY

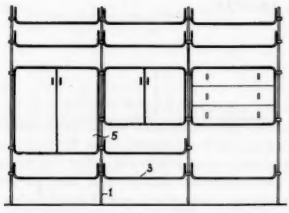
Erich Grachten, Detmold, Germany, assignor to Burris Industries, Inc., Lincolnton, N.C.

Filed Mar. 13, 1973, Ser. No. 340,855

Claims priority, application Germany, Nov. 21, 1972, 7242791[U]

Int. Cl. A47b *3/06*

U.S. Cl. 108—109 **7 Claims**



1. An assembly comprising:

a plurality of spaced apart, vertically extending, smooth surfaced tubular support members,

a plurality of retainers each encircling a corresponding one of said tubular members for sliding movement longitudinally therealong and for movement to selected rotational positions thereabout, each of said retainers having a vertically extending lip portion defining a horizontal surface and a vertically opening circular recess surrounding said one tubular member and a vertical outer surface extending parallel to said one tubular member,

a plurality of releasable clamping means each engaging a corresponding one of said retainers for clamping said one retainer to said one tubular member at a desired vertical position therealong and a desired rotational position thereabout,

a shelving component positioned between said tubular members, said component having a horizontal portion extending between said spaced apart tubular members and integral end wall portions at opposing ends of said horizontal portion and extending vertically adjacent said tubular members, and

a plurality of bracket means each mounted on the outer surface of a corresponding end wall portion of said shelv-

ing component in vertically spaced relation from said horizontal portion, each of said bracket means having a first leg extending horizontally from said corresponding end wall portion and engaging said lip horizontal surface of a corresponding one of said retainers and a second leg extending vertically from said first leg and engaging said recess,

said bracket means, said shelving component and said retainers cooperating for supporting and stabilizing the assembly, by the engagement of said lip horizontal surface with said first leg simultaneously with the engagement of said retainer outer surface with the outer surface of said end wall portions of said shelving component.

3,898,940

GROUND DRAINAGE SYSTEMS, AND METHOD AND APPARATUS THEREFOR

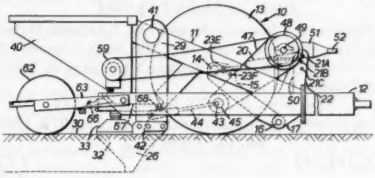
Ainsley Neville Ede, 36 Thornton Way, Cambridge, England

Filed Apr. 19, 1973, Ser. No. 352,704

Claims priority, application United Kingdom, Apr. 20, 1972, 18258/72

Int. Cl. A01c *5/00*

U.S. Cl. 111—1 **30 Claims**



1. Apparatus for making water-permeable channels in the ground, which comprises a slitter blade mounted on a carriage and extending downwardly from the carriage to below ground level for drawing edgewise through the ground by the forward movement of the carriage so as to form a slit-like channel in the soil, a hollow blade-like sand-dispensing chute whose width and depth below ground level are approximately the same as those of the slitter blade, the chute being secured to the slitter blade with its leading edge abutted against the trailing edge of the slitter blade so that the chute follows the blade in the newly-formed soil channel, and there being an elongated rearwardly-facing dispensing aperture formed in and extending substantially over the full below-ground depth of the chute, means secured to the carriage for movement therewith for introducing sand into the interior of the chute from above ground level so as to fill the chute for dispensing sand through the whole length of the elongated dispensing slot into the soil channel, and means mechanically coupled to the slitter blade for imposing vibration simultaneously both on the slitter blade and on the chute throughout the forward movement of the carriage.

3,898,941

APPARATUS FOR MANUFACTURING AND STACKING HEMMED FABRIC PIECES

Douglas J. Crawford, Troy; Roger LeMere, Petersburg, and Francis H. Hughes, Troy, all of N.Y., assignors to Cluett, Peabody & Co., Inc., New York, N.Y.

Filed Mar. 23, 1973, Ser. No. 344,227

Int. Cl. D05b *23/00*

U.S. Cl. 112—121.29 **11 Claims**

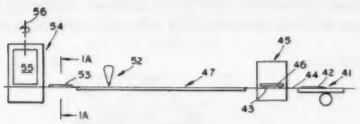
11. Apparatus for manufacturing and stacking hemmed fabric pieces and comprising in combination:

a. positioner means located along a path of travel through the apparatus for accepting and advancing the fabric pieces,

b. folder means located along said path of travel for forming a hem out of a margin of the fabric piece,

c. sew means located along said path of travel for sewing the hem along said margin,

d. stacker means located along said path of travel, and



e. said stacker means including a cartridge for receiving the hemmed fabric pieces and for stacking the pieces into said cartridge vertically and means for revolving the cartridge as successive of the hemmed fabric pieces are inserted therein whereby uneven height resulting from the hems is distributed peripherally thereabout.

3,898,942

EJECTOR FOR A WINDING DEVICE

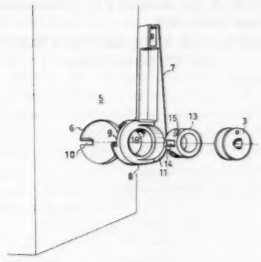
Hannes Giesselmann, Huskvarna, Sweden, assignor to Husqvarna AB, Huskvarna, Sweden

Filed Mar. 15, 1974, Ser. No. 451,705

Claims priority, application Sweden, Mar. 16, 1973, 73036931

Int. Cl.² D05B *59/04*

U.S. Cl. 112—218 A **3 Claims**



***1.** An ejector for a winding device on a sewing machine having a body including a wall; the device including a bobbin spindle on said sewing machine protruding through a hole in the body and a bushing encircling the spindle; a hub including an arm extending outwardly therefrom journaled over said bushing in said hole in the wall of the machine body concentrically with the bobbin spindle and rotatable by means of said arm; said wall and bushing including cooperating means for locking said bushing against rotation but permitting axial displacement of said bushing; said bushing and said hub including cooperating thread means for axially displacing said bushing with respect to said hub upon rotation of said hub, whereby to effect an axial, ejecting motion against a bobbin inserted on the bobbin spindle when the hub is rotated by said arm in a predetermined direction.

3,898,943

METHOD OF MAKING A QUILT

Lorraine W. Braden, 562 Ray's Road, and Etrulia A. Broome, both of Stone Mountain, Ga., assignors to said Lorraine W. Braden, by said Etrulia A. Broome, Stone Mountain, Ga.

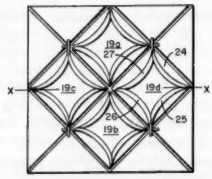
Filed Sept. 30, 1974, Ser. No. 510,231

Int. Cl.² D05F *95/00*

U.S. Cl. 112—262 **7 Claims**

1. A method of making a quilt component from a pair of fabric fragments and a window fabric comprising the steps of folding four edge portions of each of said fragments along fold lines inwardly to form an initial square, folding each corner of

said initial square to the centerpoint of said initial square to form an intermediate square, folding each resulting corner of eahc intermediate square to said centerpoint to form a final square, interconnecting the oppositely disposed inwardly folded corners of said final squares, adjoining said final squares along corresponding side edges to form a rectangular



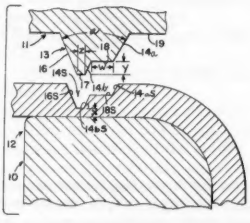
structure, placing a piece of window fabric having a configuration generally complementary to one of said final squares over the adjacent edges of said final squares in such a manner that opposite corners of said window fabric coincide with the ends of said corresponding side edges, and interconnecting the outer edges of said window fabric and said final squares.

3,898,944

SCORE AND TOOL FOR FORMING THE SCORE

Albert J. Holk, Jr., Frankfort, and Jerry D. Hawkins, Country Club Hills, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed June 18, 1973, Ser. No. 370,903
Int. Cl. B21d *51/00*
U.S. Cl. 113—1 F **8 Claims**



1. A score formed in sheet of metal comprising a bottom wall, a pair of inclined side walls extending from said bottom wall, and a ledge disposed intermediate the length of at least one of said side walls and interrupting the same.

3,898,945

METHOD FOR MAKING A LAP SIDE SEAM ON A METAL TUBULAR BOBY

Stanley Edward Rohowetz, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 238,840, March 28, 1972, Pat. No. 3,819,085. This application Feb. 15, 1974, Ser. No. 442,906
Int. Cl. B65d *7/34*
U.S. Cl. 113—120 A **5 Claims**

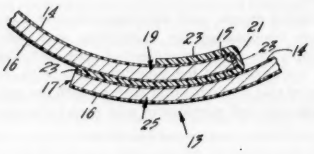
5. A method of fabricating an adhesively bonded, lap side seam of a primed metal tubular body having a protected raw metal edge on the inside lap comprising the steps of:

providing metal sheet, both surfaces having applied thereto an epoxy-phenolic primer coating;

forming said primed sheet into a tubular can body blank, said blank having a raw metal edge along at least one of its marginal portions;

applying a protective thermoplastic polyamide resin in the form of a hot melt to at least the raw metal edge of the marginal portion of said primed body blank that is to form the inside lap;

applying a thermoplastic polyamide adhesive in the form of a ribbon which wraps around the protective resin and the interior and exterior surfaces of the inside lap; and



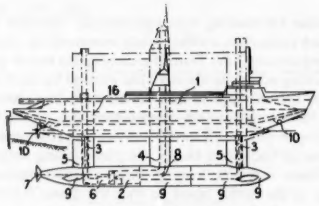
forming said body blank into a tubular can body, arranged to have a lap side seam wherein the primed interior metal surface within the seam is adjacent to and overlaps the primed opposed exterior surface within the seam and is bonded thereto by said thermoplastic adhesive.

3,898,946

SEA-GOING HIGH-COMMERCIAL-SPEED DISPLACEMENT VESSEL

Jan Zadrożny, ul. Chrzanowskiego 27 m. 7, Gdansk-Wrzeszcz; Lech Kobyliński, ul. Piastowska 70d m. 6, Gdansk-Oliwa, and Stefan Jaworski, ul. Boleslawa Chrobrego 8, Szczytno, all of Poland

Filed Sept. 20, 1973, Ser. No. 399,117
Claims priority, application Poland, Sept. 29, 1972, 158014
Int. Cl.² B63B *1/22*
U.S. Cl. 114—61 **1 Claim**

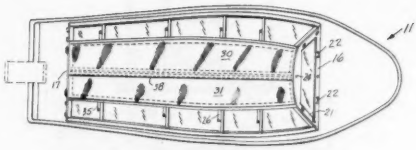


1. A sea-going high speed displacement vessel comprising, in combination, a surface hull of displacement equal to displacement of the vessel, the form of said hull being substantially similar to a rectangular pontoon having several decks; stabilizing elements at the bilge for stabilizing the vessel; at least one midwater hull having full buoyancy in form of streamlined floats with small wetted surface, said midwater hull having light ballast containers and being positioned at variable height under said surface hull; brackets mounted slidingly in said surface hull and having catches for joining said surface hull and said midwater hull after water has been removed from them by means of compressed gas; active rudders positioned in said surface hull, said stabilizing elements in the form of floats having chambers at least at the side of the surface hull's symmetry plane, the width of said chambers being adjusted by means of compressed gas, at least one midwater hull has adjustable stabilizing fins, said fins being also deepwater rudders; and power plant and screw propellers situated at the height approaching the height of the frontal resistance center at the commercial speed of said vessel, said fins, power plant and propellers being situated for permitting balancing longitudinally the vessel with respect to the resistance forces, said resistance center lying substantially at the level of the propeller shaft axis when said vessel moves forward at said commercial speed, said brackets joining said hulls having directional rudders rotated with said stabilizing elements by means of rudder engines.

3,898,947
BOAT TOP

John Paul Moore, 4320 Ryan St., Lake Charles, La. 70601

Filed May 31, 1974, Ser. No. 474,918
Int. Cl.[2] B63B 29/02
U.S. Cl. 114—71 10 Claims

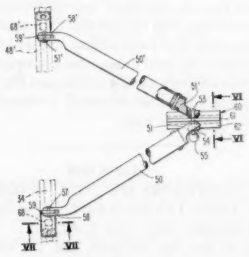


1. A boat top comprising first and second pairs of opposed, upwardly disposed walls defining an enclosure for passengers having a generally rectangular opening at the top, a pair of flexible canopy segments secured along one edge to the top edges of said first pair of walls and being inwardly extensible to overlie and cover the opening of said enclosure, respective rigid roller bars secured to the opposite edges of the canopy segments, said second pair of walls being formed with retaining recesses at the mid-portions of their top edges, said recesses being open at their tops, the opposite end portions of the roller bars being seated in said recesses when the canopy segments are extended to overlie the enclosure and being held in said recesses by gravity but being free to fall out of the recesses if the boat should overturn, said roller bars being liftable out of said recesses and the canopy segments being rollable around the respective rigid roller bars for securement to the top edges of said first pair of walls so as to uncover the opening of the enclosure.

3,898,948
MAST HANDLING

Thomas R. Huff, 60 Paoli Pk., Paoli, Pa. 19301

Filed June 24, 1974, Ser. No. 482,080
Int. Cl.[2] B63B 15/00
U.S. Cl. 114—91 3 Claims

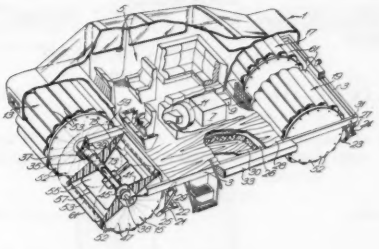


1. In a mast-handling arrangement for a sailboat with a dismountable mast having a longitudinal rope groove therein erupting to the exterior therealong, a laterally steadying rigid brace assembly pivotally and detachably attachable at a first end to the deck athwart the foot of the mast and also slidably and disengageably engageable at a second end to the mast and including at the second end a slider fitting within the rope groove.

3,898,949
AMPHIBIOUS VEHICLES

John Antony Kearsey, 19 Bramble Rise, Westdene, Brighton, Essex Bn1, 5GE, England

Continuation of Ser. No. 240,351, April 3, 1972, abandoned.
This application Apr. 24, 1974, Ser. No. 463,598
Int. Cl. B63f 3/00
U.S. Cl. 115—1 R 4 Claims

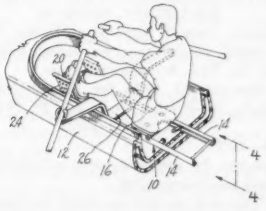


1. An amphibious vehicle comprising a body, at least one rotor carried by said body for contributing to the support and for propelling said vehicle over land and water, and drive means for rotating said rotor, said rotor including a pair of laterally spaced end members, restraining means located between said end members adjacent to the periphery of said end members, a fluid impermeable flexible membrane extending between said end members, and means for securing said membrane to said end members in fluid-tight relation thereto, said membrane between said end members being secured to said restraining means at circumferentially spaced locations, whereby said membrane is radially deformable between said locations, means for internally pressurising said membrane to a pressure such that portions of said membrane between said locations when in contact with water will present a concave driving surface, a centrally located buoyancy chamber within the rotor, and wherein each end member has a peripheral surface for land travel.

3,898,950
ROWING APPARATUS

Arthur E. Martin, Box 251 Pepperrell Pt., Kittery Point, Maine 03905

Filed Feb. 12, 1974, Ser. No. 441,735
Int. Cl. B63h 16/06
U.S. Cl. 115—24.1 5 Claims



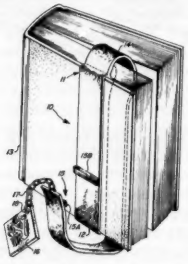
1. A rowing apparatus comprising a seat and longitudinally extending means supporting the seat and allowing fore and aft movement thereof, a continuous rigid support beam extending transversely of said longitudinal means and having upturned ends at opposite sides thereof, and a pair of riggers for assembly onto said upturned ends, said riggers having an outer end portion which when assembled with the support beam ends, extends from said support beam outwardly over the gunwale of the boat, the inner end of said riggers and the ends of said

support beam having connecting means permitting limited pivotal adjustment of said rigger in relation thereto only in a vertical plane to permit adjustment of the height of the outermost end of the rigger without impairing the strength in torsion of the connection between the rigger and the support beam.

3,898,951
BOOKMARKS

Geraldine M. Clare, 8349 E. Stella Ln., Scottsdale, Ariz. 85253

Filed Oct. 11, 1974, Ser. No. 495,399
Int. Cl.² B42D *9/00*
U.S. Cl. 116—119 **4 Claims**



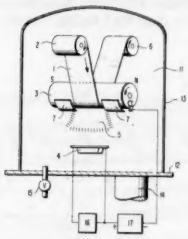
1. A bookmark comprising:
an elongated elastic ribbon like member having one end turned back on itself and fastened thereto to form a closed loop portion,
the other end of said ribbon like member forming an appendage extending from the loop portion,
said loop portion provided for extending around one of the covers of a book with the appendage arranged to extend from the loop portion at one edge of the book between the pages of a book being marked and out the other edge of the book, and
means provided at one end of said appendage for detachably fastening said end to said loop portion at a point thereon arranged on the outside of the book being marked.

3,898,952
APPARATUS FOR PRODUCTION OF MAGNETIC RECORDING MEDIUM

Ryuji Shirahata; Tatsuji Kitamoto; Mahito Shimizu, and Masaaki Suzuki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed July 25, 1974, Ser. No. 491,900
Claims priority, application Japan, July 25, 1973, 48-83837
Int. Cl. C23c *13/12*
U.S. Cl. 118—49.1 **7 Claims**

1. An apparatus for the continuous production of a magnetic recording tape comprising
a vacuum chamber containing means including an anode and a cathode for generating a plasma of the glow discharge of a gas therebetween,
a rotatable cylindrical permanent magnet as the cathode of the plasma generating means,
a tape substrate supply roll and a tape substrate take up roll for passing a tape substrate in contact with the rotatable cylindrical permanent magnet as the cathode of the plasma generating means and positioned such that the tape contacts the cylindrical permanent magnet whereby the rotable magnet rotates as the tape is passed by the supply roll and the take up roll and such that the tape passes through a plasma zone concentrated by the cylindrical permanent magnet, and

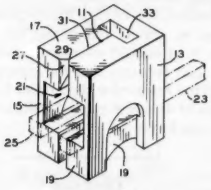


means for evaporating a ferromagnetic substance as the anode of the plasma generating means.

3,898,953
MOLDED FILAMENT COATING DIE

Warren A. Couture, 4916 So. Wayne Ave., Fort Wayne, Ind. 46807

Filed June 21, 1974, Ser. No. 481,511
Int. Cl.² B05C *11/02*
U.S. Cl. 118—125 **6 Claims**



1. A one-piece molded wire coating die for removing excess fluid insulating material from a conductive wire passing along a generally vertical wire axis through the die comprising:
upstanding side wall portions;
and a floor and a roof each lying generally transverse to the wire axis and interconnected by the side wall portions, the floor and roof each having a wire passing fluid wiping aperture therein, the floor aperture adapted to provide a first gross fluid wiping and the roof aperture adapted to provide a later fine fluid wiping, the underside of the floor remote from the roof being concave opening downwardly for improved gross wiping action and the underside of the roof configured as an inverted V-shaped slot having an apex near the wire axis.

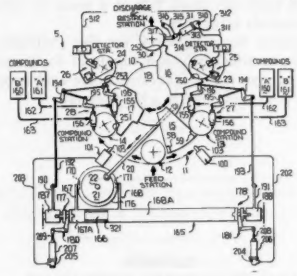
3,898,954
COMPOUND APPLYING MACHINE

Raymond F. Galitz, La Grange Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Division of Ser. No. 107,643, Jan. 19, 1971, Pat. No. 3,760,928. This application Sept. 13, 1973, Ser. No. 396,858
Int. Cl.² B05C *7/02*
U.S. Cl. 118—315 **8 Claims**

1. An article conveying apparatus comprising means defining a generally circular path of article travel, means for serially feeding individual articles to said article path at a feed station thereof, means oscillating along said article path across said feed station for directing successive articles at said feed station in opposite directions along said article path, means for serially removing individual articles from said article path at a discharge station thereof, means defining a first article work station between said feed and discharge stations in both direc-

tions of article travel along said article path to which individual articles are delivered by said oscillating means, means for elevating individual articles from and lowering individual articles to said article path at said work stations, means for rotating each article at each work station when at its elevated position, means defining a second article work station between each first article work station and said discharge station, additional means oscillating along said article path across



each of said first and second article work stations for delivering an article from each first work station to the second work station downstream therefrom while directing an article away from each second work station toward said discharge station, means for applying a coating to each article and each first article work station during the rotation of each article thereat, and means at each second article work station for inspecting the coatings so applied.

3,898,955

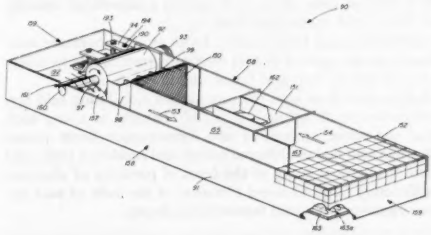
ADHESIVE BINDING APPARATUS

Alan S. Rosette, Fairport, and Barry J. Tepper, Rochester, both of N.Y., assignors to Armarco Marketing Company Inc., Rochester, N.Y.

Filed Feb. 22, 1973, Ser. No. 334,865

Int. Cl.[2] B05C *1/02, 11/11*

U.S. Cl. 118—603 **8 Claims**



1. An adhesive reservoir and applicator assembly including,

a. a reservoir having a bottom, a pair of elongate sides and a pair of transverse ends extending between said elongate sides;

b. a pumping compartment situated in one end of said reservoir containing a cylindrical adhesive applicator rotatably mounted on an axle supported by said elongated sides, the length of said applicator being less than the width of said reservoir;

c. a screen extending inwardly from an elongate side of said reservoir situated immediately in front of and upstream from said adhesive applicator thereby separating said pumping compartment from an intake compartment, the length of said screen being less than the width of said reservoir;

d. a baffle extending from said screen toward an end of said reservoir away from said pumping compartment, said baffle separating said intake compartment from a discharge compartment;

e. heating means associated with said reservoir to heat adhesive material to flow temperature; and

f. adhesive temperature control means;

whereby a first portion of said adhesive material is readily circulated by rotation of said applicator axle from the pumping compartment through said discharge and intake compartments and returned to said pumping compartment upon passing through said screen which thereby reduces internal air ebullition in said adhesive material, and whereby a second portion of said hot adhesive material is applied to the edge of pages by said adhesive applicator.

3,898,956

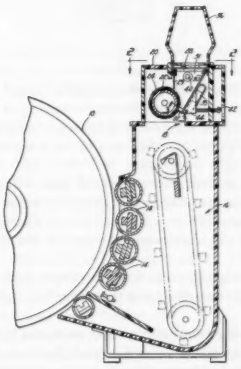
TONER REPLENISHER

Thomas E. Andrako, Maple Heights, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Nov. 16, 1973, Ser. No. 416,610

Int. Cl.[2] G03G *15/08*

U.S. Cl. 118—637 **2 Claims**



1. In a toner system for electrostatic image development employing a mix of non-consumable carrier members and consumable toner particles, the system including a mixing chamber wherein spent mix is deposited and caused to be resupplied with toner particles clinging thereto, said chamber having a supply entrance opening above the mixing area;

the improvement in toner particle supply, comprising:

a housing seated on said chamber over said supply entrance opening;

a brush of circular cross-section mounted in said housing adjacent said entrance opening, said brush having a bristle mat surface, and means for rotating said brush about its central axis;

a supply hopper located to expel toner from said hopper through said opening by gravity, said hopper mounted adjacent said brush with said brush as the sole closure blocking the opening;

the hopper opening is rectangular, defined by a vertical front hopper wall and a sloping rear hopper wall terminating at a location substantially directly below said front wall, and end walls;

a doctor blade formed by a serrated edge formation of said rear wall termination on the side of said opening from which the mat of said brush exits, said blade extending partially into said mat to cause the bristles to bend and then snap back after passing the blades; and

a vibrator means for vibrating said rear wall to shake toner down to said brush and to actuate the particle dispensing action of said brush;

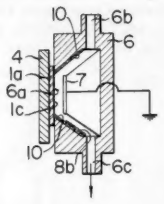
whereby, the bristles pick up toner particles from a hopper supply, and flick the particles free in a descending cloud to said mixing chamber.

3,898,957

DEVELOPING UNIT FOR ELECTROSTATIC LATENT IMAGE

Masao Masumura, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1973, Ser. No. 427,212
Claims priority, application Japan, Dec. 28, 1972, 47-3473
Int. Cl. G03g *13/10*
U.S. Cl. 118—637 **8 Claims**



1. A developing unit for electrostatic latent images of the type in which a recording member having an electrostatic latent image formed thereon is held in an upright position and in abutment with an opening in a developing box to thereby form a liquid-tight developing chamber, into which a liquid developer is supplied to develop the latent image on the recording member and is then displaced from the interior of the developing chamber upon completion of the developing process, including the improvement wherein the developing box comprises:

an interior access area at least the bottom portion of which inclines downwardly from the lower edge of said opening; and

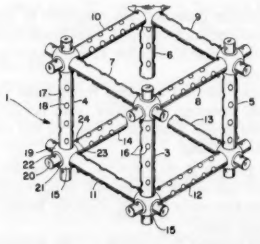
a liquid-developer-repellent resin material forming the surface of said bottom portion and the lower edge of said opening to facilitate the displacement of the developer therefrom.

3,898,958

OPEN WATER FISH FARMING APPARATUS

Peter P. Pranis, Jr., 4108 W. 217th St., Fairview Park, Ohio 44126

Filed June 13, 1974, Ser. No. 478,980
Int. Cl. A01k *61/00*
U.S. Cl. 119—3 **37 Claims**



1. Apparatus for fish farming, comprising:

a plurality of elongated means for providing surface areas for the anchoring, growth and accumulation of microorganisms and the like, said elongated means having a substantially large exterior surface area and each including shelter means providing restricted areas within said elongated means for sheltering relatively small fish from their natural predators including relatively larger fish; and means for permanently connecting said elongated means in a rigid three dimensional lattice framework, said lattice framework having relatively large open volumes within which relatively large fish may freely swim about, and said means for sheltering providing said restricted areas for such relatively small fish as a place of refuge from such relatively large fish;

said apparatus thus providing for fish cultivation being attractive to small fish as a supply of food and shelter, whereby larger fish remain proximate said apparatus by attraction to small fish as a food supply.

3,898,959

PROCESS FOR THE GROWTH OF HYDROCARBON-CONSUMING MICROORGANISMS

Nai Yuen Chen, Titusville, and Sundaresa Srinivasan, Princeton Junction, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. Nos. 58,324, July 27, 1970, abandoned, and Ser. No. 58,736, July 27, 1970, abandoned. This application Jan. 15, 1973, Ser. No. 323,580
Int. Cl. C12b *1/00*
U.S. Cl. 195—28 R **13 Claims**

1. A process for the growth of an aerobic, hydrocarbon-consuming microorganism comprising:

a. maintaining in a fermentation vessel for a predetermined residence time a liquid fermentation broth containing a culture of said hydrocarbon-consuming microorganism and, for the growth of said hydrocarbon-consuming microorganism, a hydrocarbon as a source of carbon, mineral nutrients, and water,

b. injecting air into said fermentation broth at a rate of 1 to 50 volumes per volume of said fermentation broth per minute, at a dilution ratio of 1.2 to 5, and at a superficial velocity of 200 to 500 meters per hour.

c. maintaining said fermentation broth at a temperature conducive to the growth of said microorganism solely by injection of said air into said fermentation broth, and

d. during growth of said microorganism circulating said fermentation broth through a bed of charcoal at a rate such that the entire amount of said fermentation broth passes through said bed of charcoal within said residence time, said bed of charcoal being in the form of particles of charcoal sufficiently large to avoid filtration of the cells of said microorganism from said fermentation broth.

3,898,960

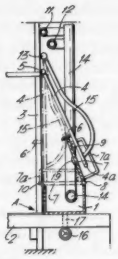
APPARATUS FOR FEEDING ANIMALS

Timothy Michael Gilchrist, Marvis Bank, Newrath, Waterford, Waterford County, Ireland

Filed Nov. 19, 1973, Ser. No. 417,093
Claims priority, application Ireland, Nov. 18, 1972, 1406/72
Int. Cl. A01k *5/00*
U.S. Cl. 119—51 R **5 Claims**

1. An animal feeding device comprising of an open-topped trough, means for introducing under pressure a feed slurry

into the trough, means for introducing a liquid under pressure into the trough, and a lid movable to a position for closing and



sealing the trough in a pressure type manner when feed slurry or liquid under pressure is introduced into the trough.

3,898,961

STEAM GENERATOR

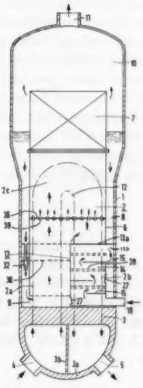
Hans Mayer, Bubenreuth, and Heinz-Jürgen Schröder, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 12, 1973, Ser. No. 369,229

Claims priority, application Germany, June 26, 1972, 2231182

Int. Cl. F22b *1/06*

U.S. Cl. 122—32 **4 Claims**



1. A pressurized-water coolant nuclear reactor steam generator including a vertical housing containing an inverted U-shaped nest of heat-exchanging tubes having coolant inlet and outlet ends and radially enclosed by a vertical guide jacket and having a feed water inlet adjacent to said nest's outlet end, steam-generating water in said housing flowing downwardly in said down-draft space and upward through said guide jacket and radially outwardly and inwardly around the top and bottom of the guide jacket respectively, thus establishing a recirculating flow path, and a feed water preheater having walls forming a chamber surrounding a substantial portion of said tube nest's outlet end and connected with said feed water inlet, said preheater chamber having an outlet for the preheater's output; wherein the improvement comprises means connected with said outlet of said preheater chamber for forming at least one jet of the preheated feed water output of said preheater, directed in the direction of said flow to add circulating force thereto.

3,898,962

CONTROL SYSTEM AND DEVICES FOR INTERNAL COMBUSTION ENGINES

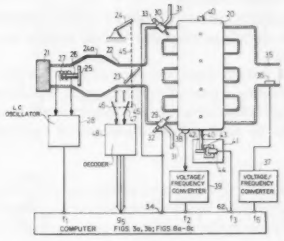
Gunther Honig, Braunschweig, and Uwe Kiencke, Moglingen, both of Germany, assignors to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed May 31, 1973, Ser. No. 365,729

Claims priority, application Germany, June 2, 1972, 2226949

Int. Cl.² F02D *5/00*

U.S. Cl. 123—32 EA **115 Claims**



1. In combination with an internal combustion engine having an induction pipe, a control device for controlling at least one solenoid (**32, 33**) operated fuel injection valve (**29, 30**) in dependence upon the rate of air flow to the engine through the induction pipe, comprising

an air flow meter (**25, 26**) to be arranged in the induction pipe of the engine;

an oscillator (**28**), the frequency of which is controlled by the air flow meter (**25, 26**) to provide an oscillator output signal whose frequency is a function of the rate of air flow;

a frequency digital converter connected to receive the oscillator output signals and providing digital signals representative of the frequency of the oscillator, and hence of the rate of air flow;

and a digital computing circuit having an input connected to receive the digital signals and having an output connected to and controlling the solenoid (**32, 33**) of the fuel injection valve (**29, 30**), said computing circuit comprising

a digital differential analyzer whose input is responsive to said digital signals derived as a function of frequency of the oscillator.

and at least one interpolator (**58, 61**) having stored therein simulated operating characteristics of the internal combustion engine over its operating range to modify the digital signals passing through said computing circuit in accordance with said simulated operating characteristics of the combustion engine.

3,898,963

ELECTRONICALLY CONTROLLED FUEL INJECTION SYSTEM FOR ROTARY INTERNAL COMBUSTION ENGINES

Hiroyoshi Iwata; Koichi Sekiguchi, and Yoshikazu Ishikawa, all of Tokyo, Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed July 5, 1973, Ser. No. 376,389

Claims priority, application Japan, July 6, 1972, 47-79166

Int. Cl.² F02B *3/00*

U.S. Cl. 123—32 EA **3 Claims**

1. In combination, a rotary internal combustion engine and an electronically controlled fuel injection system for said rotary internal combustion engine comprising:

a fuel injection control valve for controlling fuel injection into said engine;

actuating means for opening said fuel injection control valve when said actuating means is energized;

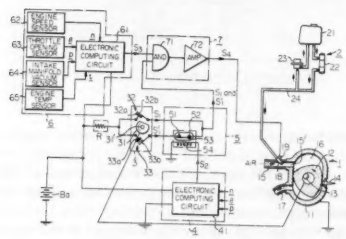
a triggering pulse signal generator operatively connected to a crank shaft of said engine and responsive to the angular position of said crank shaft to produce two alternating triggering pulse signals each representing fuel injection commencement time;

first electronic computing means responsive to at least one of electric signals representing prevailing values of engine deceleration operation including engine speed, throttle opening and intake manifold vacuum to produce an electric engine deceleration operation signal;

electronic control means;

cut-off means for cutting off one of said alternating triggering pulse signals in response to said engine deceleration operation

signal, said cut-off means comprising an electromagnetic relay including a pair of relay contacts which are opened by the movement of a relay armature when a relay coil is energized by said engine deceleration operation signal



form said first electronic computing means, said relay contacts being closed by said relay armature when said engine deceleration operation signal is absent, said cut-off means being connected between output terminals of said triggering pulse signal generator and said electronic control means and being operative to prevent transmission therethrough of one of said alternating triggering pulse signals when said relay coil is energized;

second electronic computing means responsive to at least one of electric signals representing prevailing values of engine speed, throttle opening, engine temperature and intake manifold vacuum to produce an electric output pulse signal having a pulse width representing the proper duration of fuel injection under prevailing engine operating conditions; and

said electronic control means being responsive to said output pulse signal from said second electronic computing means and said alternating triggering pulse signals to produce an electric command pulse signal which is fed into said actuating means energizing said actuating means to open said fuel injection control valve.

3,898,964

FUEL-INJECTION ARRANGEMENT CONTROLLED IN DEPENDENCE UPON THE AIR INFLOW RATE

Peter Werner, Schwieberdingen; Ulrich Drews, Stuttgart; Norbert Rittmannsberger, Schwieberdingen; Wolfgang Busse, Stuttgart; Helmut Moder, and Karl-Heinz Ohr, both of Schwieberdingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

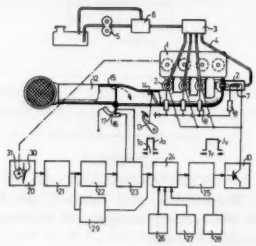
Filed Sept. 21, 1973, Ser. No. 392,811

Claims priority, application Germany, Aug. 31, 1972, 2242795

Int. Cl.[2] F02M *51/02*

U.S. Cl. 123—32 EA **53 Claims**

1. In an internal-combustion engine having at least one engine cylinder, an air-intake passage communicating with the interior of such cylinder, a piston movable in such cylinder, an engine crankshaft connected to such piston, an ignition arrangement for igniting fuel-air mixture in such cylinder and including electromechanical ignition-signal generating means coupled to the engine crankshaft and operative for generating a train of electrical crankshaft-positionsynchronized ignition signals, and an electrically actuatable fuel-injection valve having an electrical input for receipt of a valve-opening pulse and operative for injecting fuel into such cylinder for a time interval corresponding to the duration of such valve-opening pulse, for use therewith, a fuel-injection control system comprising airflows sensing means for determining the rate of airflow through the air-intake passage of the engine; triggering means including electronic frequency divider means for receiving the train of electrical ignition signals and converting



the same into a lower-frequency train of electrical fuel-injection triggering pulses; first pulse-generating means connected to said triggering means and to said airflow sensing means and operative for generating a first control pulse having a pulse duration dependent upon the airflow rate detected by said airflow sensing means; second pulse-generating means connected to said triggering means and to said first pulse-generating means and operative upon generation of a triggering pulse for generating a second control pulse having a pulse duration dependent upon at least one other variable engine operating condition; and third means for generating a composite valve-opening pulse comprised of said first and second control pulses for application to the electrical input of the fuel-injection valve.

3,898,965

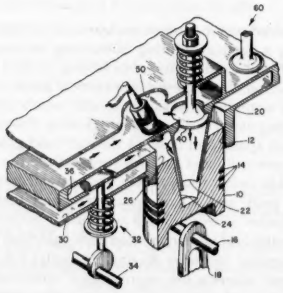
AUXILIARY FLUID INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Francis A. Fischer, 464 Park Rd., West Hartford, Conn. 06607

Filed Aug. 20, 1973, Ser. No. 390,074

Int. Cl. F02b *75/02*; **F02d** *39/02*

U.S. Cl. 123—75 B **5 Claims**



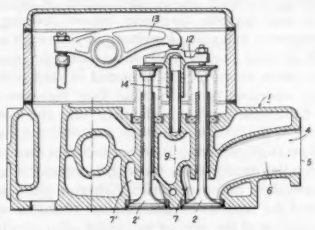
1. An internal combustion engine comprising:

a. at least one cylinder,
b. a cylinder head for said cylinder including an annular baffle extending downwardly from the remainder of said head into said cylinder,
c. a piston slidably received in said cylinder and having a recess in its upper portion to receive said baffle when said piston is in its top dead center position; said cylinder, cylinder head, baffle and piston, when said piston is in its top dead center position defining an annular combustion chamber surrounding the outside of said baffle; and said baffle and said piston, when said piston is in its top dead center position, defining an auxiliary chamber surrounded by said baffle and generally isolated from said combustion chamber; the length of that portion of said baffle which is received in said piston recess when said piston is in its top dead center position being greater than one-half of the stroke of said piston,
d. an intake valve means communicating directly with said combustion chamber for introducing a fuel and air charge to said combustion chamber,
e. an exhaust valve means communicating directly with said combustion chamber for carrying away spent gases of combustion from said combustion chamber,
f. a passageway for delivering an auxiliary fluid to said auxiliary chamber, and
g. an auxiliary valve means in said cylinder head between said passageway and said auxiliary chamber for controlling the flow of auxiliary fluid from said passageway to said auxiliary chamber.

3,898,966
CYLINDER-HEAD OF AN INTERNAL COMBUSTION ENGINE WITH TWO INTAKE VALVES FOR EACH CYLINDER

Hans List, 126 Heinrichstrasse, Graz, Austria

Filed Mar. 30, 1971, Ser. No. 129,344
Int. Cl. F02b *75/00*
U.S. Cl. 123—75 B **2 Claims**

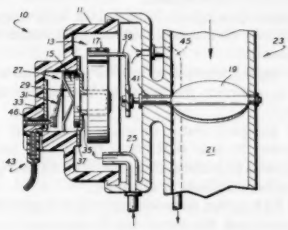


1. A cylinder head of an internal combustion engine having two intake valves for each cylinder adjoining each other and arranged eccentrically in relation to the cylinder axis, the first of the two intake valves being arranged at least approximately in a longitudinal median plane of the internal combustion engine, the second intake valve being offset by approximately 90° towards the suction-end sidewall of the cylinder head in relation to the first intake valve, a first inlet duct extending from said cylinder head sidewall in transverse relation thereto to the first intake valve, a second inlet duct extending from said cylinder head sidewall to the second intake valve and having a convex curvature in relation to the cylinder axis, each said inlet duct comprising a spiral-like section wound around the axis of the associated intake valve and inclined towards the valve, whose sense of winding is identical for both inlet ducts, each inlet duct extending at the point of transition to the spiral-like section laterally outside the associated intake valve in relation to the cylinder axis and extending at the latter point in an approximately tangential relation to the inner wall of the associated cylinder.

3,898,967
AUTOMATIC CHOKE ASSEMBLY

John E. Bennett, Sheffield; Max L. Jayne, North Warren, and Robert S. Orbanic, E. Warren, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 4, 1973, Ser. No. 366,347
Int. Cl. F02d *11/08;* **F02m** *1/10, 23/04*
U.S. Cl. 123—119 F **7 Claims**



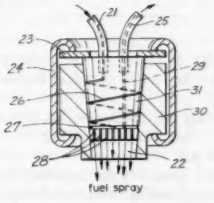
1. In an automatic choke assembly for an internal combustion engine having intake and exhaust manifolds, at least one carburetor having a conduit therein adapted for supplying air and fuel to said engine, a valving means for controlling the ratio of said air and fuel within said conduit, and an alternator for supplying electrical energy to said engine, wherein said choke assembly comprises a housing member defining first and second chambers, means for supplying heat indicative of the temperature of said engine to said first chamber, a bimetallic spring member positioned within said first chamber and operatively connected to said valving means, a heating means thermally connected to said bimetallic spring member, and a terminal contact member electrically connected to said alternator, the improvement comprising:

a thermally responsive and electrically conductive member positioned within said second chamber, said thermally responsive and electrically conductive member having at least one arm portion thermally and electrically connected to said heating means and at least one tongue portion adapted for moving in a snap-action manner to engage said terminal contact member when the temperature surrounding said thermally responsive and electrically conductive member exceeds a predetermined level whereby said heating means is energized during operation of said engine, said tongue portion comprising a pair of spacedly positioned lateral strip members and a contact strip member positioned substantially therebetween, said central strip member separated from each of said lateral strip members by a longitudinal slot.

3,898,968
THERMO INSULATED HYDRAULIC RESTRICTORS

Isidoro N. Markus, 65-36 99th St., Rego Park, N.Y. 11374

Continuation of Ser. No. 383,067, July 27, 1973. This application Nov. 2, 1973, Ser. No. 412,285
Int. Cl. F22b *9/06*
U.S. Cl. 123—122 E **12 Claims**



1. In an internal combustion engine having at least a combustion chamber,

a supply of fuel,
a fuel injector for injecting fuel from said supply into said engine combustion chamber at a preheated temperature, a fuel pump between said supply and fuel injector to pressurize the flow of fuel from the supply to the combustion chamber through said injector,
said fuel injector comprising a ceramic thermoinsulated hydraulic restrictor block having cold fuel inlet means and hot fuel outlet means,
a constricted passageway defined in said ceramic block hydraulically connecting said fuel inlet means to said fuel outlet means,
a sleeve coupled about a peripheral portion of said ceramic block to connect the same to the engine combustion chamber,
said fuel pumped under pressure along said constricted passageway by said fuel pump frictionally increasing its temperature to preheat the same prior to its injection into said engine combustion chamber,
and said fuel outlet means having fuel injection holes located to inject the increased temperature fuel directly into the engine combustion chamber.

3,898,969

FUEL SUPPLY SYSTEMS FOR ENGINES

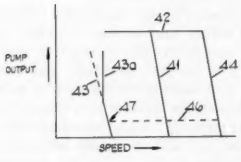
Malcolm Williams, Solihull; Christopher Robin Jones, Alcester, and Richard William Crookes, Solihull, all of England, assignors to C.A.V. Limited, Birmingham, England

Filed Dec. 28, 1973, Ser. No. 429,373

Claims priority, application United Kingdom, Jan. 6, 1973, 890/73

Int. Cl. F02b *3/00*; **F02m** *39/00*

U.S. Cl. 123—139 E **3 Claims**



1. A fuel supply system for an engine, including control means for determining the rate of fuel supply by the system, a demand transducer for providing a signal to the control means representing a demanded engine operating parameter thereby defining engine operating curves having a first predetermined slope, means for limiting the minimum speed of the engine in accordance with the rate of supply of fuel to produce an engine idling curve of a second predetermined slope less steep than said first predetermined slope, and means operable when the engine speed falls below a predetermined value for supplementing the input applied to the control means by the demand transducer so as to simulate an increased demand and produce an engine idling curve having a third predetermined slope steeper than said first predetermined slope.

3,898,970

FUEL INJECTOR ASSEMBLY

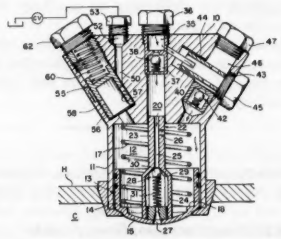
Alexander Malpass, Sr., 5131 Carolina Beach Rd., Wilmington, N.C. 28401

Filed May 24, 1973, Ser. No. 363,423

Int. Cl. F02m *49/02*

U.S. Cl. 123—139 AJ **2 Claims**

1. A fuel injector assembly for injecting liquid fuel into a combustion zone comprising: means defining a variable volume control chamber including a movable working member movable in one direction to diminish the volume of said control chamber and movable in an opposite direction to increase the volume of said control chamber and mountable during use of the fuel injector assembly such that said working member is in direct communication with the combustion zone; fuel injecting means connected to said working member and movable therewith for injecting liquid fuel into the combustion zone in an amount and at a rate proportional to the extent and rate of movement of said working member in said one direction; biasing means for continuously biasing said working member in said opposite direction; means for supplying liquid fuel into the interior of said control chamber thereby preventing movement of said working member in said one direction due to the incompressible nature of the liquid fuel; and modulator valve means responsive to the fuel pressure in said control chamber for modulating the exhausting of fuel from said control chamber as a function of the pressure exerted on said working member from the combustion zone to thereby control the rate and extent of movement of said working member in said one direction to accordingly control the timing and amount of fuel injected into the combustion zone; said fuel injecting means comprising means defining a variable volume pumping chamber including a pump plunger connected to said



working member and movable therewith to vary the volume of said pumping chamber, means for supplying liquid fuel into said pumping chamber during movement of said working member in said opposite direction, means defining a pump outlet passageway extending longitudinally through said pump plunger from said pumping chamber into the combustion zone, and check valve means mounted in said pump outlet passageway operable to permit fuel flow therethrough in a direction from said pumping chamber into the combustion zone but not in the reverse direction; said means for supplying liquid fuel into said pumping chamber includes means defining a bore extending transversely through a portion of said pump plunger providing communication between said outlet passageway and the interior of said control chamber when said pump plunger is at the end of its stroke after moving in the opposite direction to admit fuel into said pumping chamber from said control chamber, and wherein said pumping chamber has a wall portion which covers said bore to prevent further fuel admission therethrough after said pump plunger has moved a predetermined distance from the end of said stroke in said one direction.

3,898,971

MULTIPLE PULSE CAPACITOR DISCHARGE IGNITION CIRCUIT

Robert P. Lefevre, 800 Ocean Blvd., Rye, N.H. 03870

Filed Jan. 30, 1973, Ser. No. 327,939

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 CB **14 Claims**

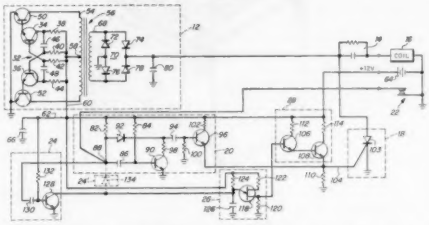
1. A multiple pulse capacitor discharge ignition circuit adapted for use with an engine ignition system having an ignition coil and ignition synchronizing means for defining ignition periods comprising:
an ignition capacitor;
a continuously operating, high speed charging circuit connected directly to the ignition capacitor for rapidly charg-

ing said ignition capacitor and continously supplying power for charging the ignition capacitor;

a switching circuit for closing a circuit through said ignition capacitor and said ignition coil;

a free running clock circuit for producing discrete, high speed switching signals independently of the charging circuit for operating said switching circuit; and

a clock control circuit connected between the synchronizing means and the clock circuit so as to isolate the clock



circuit from the synchronizing means, the clock control circuit being responsive to said ignition synchronizing means to enable delivery of said switching signals to said switching circuit during ignition periods to provide a plurality of current discharges from said ignition capacitor through said ignition coil, the control circuit being further responsive to termination of each ignition period by the ignition synchronizing means to disenable delivery of switching signals from the clock circuit to the switching circuit.

3,898,972

IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH AUTOMATIC TIMING SHIFT

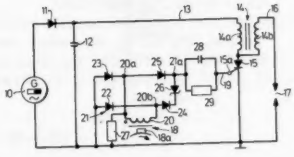
Georg Haubner, Berg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Nov. 15, 1973, Ser. No. 416,225

Claims priority, application Germany, Nov. 16, 1972, 2256174

Int. Cl. F02p *3/06*

U.S. Cl. 123—148 E **8 Claims**



1. An ignition system for an internal combustion engine, comprising:

an ignition coil having a primary winding and a secondary winding;

a semiconductor switching element having a control electrode leading to a control path therein and having a switched path in circuit with said primary winding of said ignition coil;

at least one spark plug in circuit with said secondary winding of said ignition coil;

a mechanically driven ignition timing pulse generator of the kind producing two electrical pulses of opposite polarity in quick succession for each spark cycle, arranged so that the first of said two pulses has the greater amplitude;

a full wave rectifier in circuit with said timing pulse generator and said control path of said semiconductor switching element, so as to apply both of said pulses to said control path of said semiconductor switching element in the polarity required for switching said semiconductor switching element on;

a voltage threshold diode means interposed in the path of said full wave rectifier for unbalancing the output thereof in such a way that when said timing pulse generator is driven at low speed, the first of said two pulses is effectively suppressed and the second is applied to said semiconductor switching element for ignition timing, and

capacitor means bridged by a resistor in series with said control path of said semiconductor switching element of such electrical magnitudes that at higher driven speeds of said timing pulse generator, the second of said two pulses is counteracted and thereby effectively suppressed by the voltage across said capacitor.

3,898,973

DEVICE FOR CONTROLLING THE FEEDING OF FUEL TO AN INTERNAL COMBUSTION ENGINE

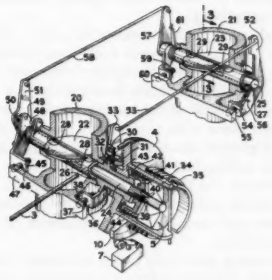
Marcel Vidberg, Montbeliard, France, assignor to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of, France

Filed Apr. 12, 1973, Ser. No. 350,651

Claims priority, application France, May 25, 1972, 72.18713

Int. Cl. F02b *77/00*

U.S. Cl. 123—198 DB **10 Claims**



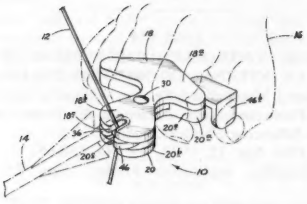
1. A device for controlling the feeding of fuel to an internal combustion engine, comprising a body defining a passageway, a fuel feed flow regulating means movable between a first position for opening the passageway and a second position for substantially closing the passageway, a control element for actuation by the user, connecting means operatively connecting the control element to the regulating means, the connecting means comprising a first member carrying the regulating means, a second member integral with the control element, bearing means within said body, the second member having a tubular portion rotatably mounted in said bearing means and extending transversely through said passageway the first member having a generally cylindrical shape and being rotatably mounted in said second member, aperture means being defined by the cylindrical portion of the second member for allowing passage of the regulating means therethrough, a releasable coupling interposed between the first member and the second member for normally engaging the second member with the first member to drive the first member, electromagnetic means for releasing the coupling, first resiliently yieldable return means associated with the first member, and second resiliently yieldable return means associated with the second member, the first and second resiliently yieldable means being independently operative to bias their respective associated members in a direction to normally bring the regulating means to said second position.

3,898,974

ARCHERY BOWSTRING RELEASE

Elmer L. Keck, 1705 S.E. 136th Ave., Vancouver, Wash. 98664

Filed Aug. 21, 1974, Ser. No. 499,175
Int. Cl.[2] F41C 19/00
U.S. Cl. 124—35 A 13 Claims



11. A device for aid in drawing and releasing an archery bowstring comprising

a top body plate and a bottom body plate of substantially similar configuration, each body plate having an elongate handle portion and a string receiving portion secured to and projecting outwardly from said handle portion intermediate the ends of the handle portion and occupying a common plane with said handle portion, said string receiving portion having a notch formed therein which extends substantially normal to said plane and opens to the forward end thereof,

spacer means maintaining a laterally spaced relationship between said string receiving portions of said top and bottom plates,

means securing said body plates in registry with each other with said notches defining a common string receiving channel open to the forward end of the body plates,

a string holding means including an elongate arm pivotally connected to a body plate for swinging in a plane intermediate said string receiving portions of said body plates and said holding means being movable between a cocked position extending across said common string receiving channel for holding a bowstring therein and a release position swung laterally of said channel forwardly of its cocked position, and

catch means for holding said string holding means in its cocked position and for releasing

holding means to permit pivoting of the holding means and release of a bowstring

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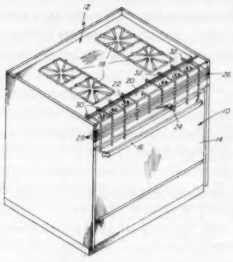
3,898,975

HEATING APPLIANCE WITH PROTECTIVE GUARD

Wayne T. Kemp, Kutztown, Pa., assignor to Raytheon Company, Lexington, Mass.

Filed Sept. 3, 1974, Ser. No. 503,006
Int. Cl.[2] A43B 21/36
U.S. Cl. 126—42 10 Claims

1. A heat-producing app'iance comprising a housing having a panel subject to high temperatures during operation of the appliance, electrical switch means within the housing, switch-actuating means operatively associated with said switch, and a guard removably mounted in covering relation to said panel and having projecting means extending through said panel for



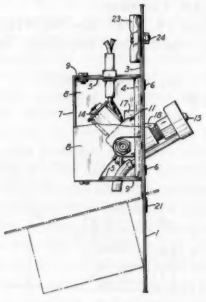
effecting operation of said switch when the guard is in position of use over the panel.

3,898,976

HUMIDIFIER MOUNTING FOR WARM AIR HEATING SYSTEM

William H. Coffman, Jr., Mt. Pleasant, Pa., assignor to Lewbill Industries Inc., Scottdale, Pa.

Filed Oct. 21, 1974, Ser. No. 516,145
Int. Cl.[2] F24F 3/14; F24H 3/00
U.S. Cl. 126—113 7 Claims

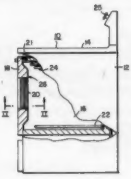


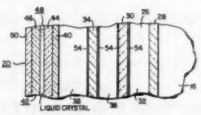
1. In a warm air heating system, the combination with a warm air passage having a sheet metal wall with an opening therein, of a humidifying unit comprising a metal plate normally closing said opening and having a marginal area inside said passage extending along one side of the opening, the rest of the plate being outside the passage and overlapping said wall around the rest of the opening, releasable securing means holding the plate flat against the outer surface of said wall, and humidifier means mounted on the plate and exposed to the inside of said passage, the plate at opposite ends of said marginal area being provided with slots extending inwardly toward each other at the junction of said marginal area and the rest of the plate, and said slots receiving the adjoining overlapped portions of said wall to form a hinge connection between the wall and plate, whereby when said securing means is released, said plate and humidifier means can be swung outwardly away from said wall without becoming disconnected from it.

3,898,977
LIQUID CRYSTAL DOOR WINDOW SHUTTER ARRANGEMENT FOR SELF-CLEANING COOKING OVEN

Robert Draper, Penn Hills, Pa., assignor to White-Westinghouse Corporation, Cleveland, Ohio

Filed Jan. 28, 1974, Ser. No. 437,433
Int. Cl.[2] F24D *15/04*
U.S. Cl. 126—200 **7 Claims**



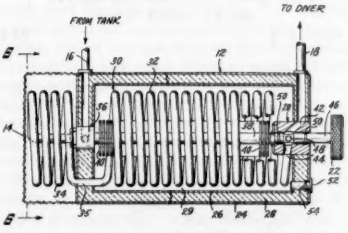


1. In a pyrolytic self-cleaning cooking oven, said oven having an opening thereinto;
a door for closing said opening, said door having a window therein;
means including a liquid crystal material associated with said window for providing an optical shutter operative at elevated temperatures in said oven corresponding to a heat-cleaning temperature range; and
said means permitting transmission of light sufficient for viewing through said window when the temperature of said oven is below the heat cleaning range and excluding transmission of light sufficient for viewing through said window when the temperature of said oven is in a heat-cleaning range.

3,898,978
BREATHING GAS HEATER

Douglas Larry Marcus, Baltimore, Md., assignor to Joseph M. Schwartz, Lutherville, Md., a part interest

Continuation-in-part of Ser. No. 314,373, Dec. 12, 1972, Pat. No. 3,815,573. This application Apr. 2, 1974, Ser. No. 457,204
Int. Cl. A62b *7/02*
U.S. Cl. 126—204 **5 Claims**

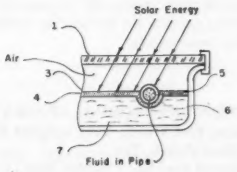


1. A portable gas heating system for attachment to a pressurized gas source to provide heated breathing gas to a diver's mouth and head and to reduce the body's thermal heat loss in a cold aqueous environment by utilizing a small heat input where thermal loss is the greatest comprising:
a Vortex tube which separates high pressure gas from a diver's tank into cold and hot streams;
metal tubing connected to said Vortex tube which carries the cold stream of separated gas to an outer section for exposure to the aqueous environment and for heat absorption and to an inner section into a heat exchanger for further thermal energy addition before being mixed with the hot stream and breathed by the diver;
a double walled insulated chamber containing said Vortex tube and the inner section of said metal tubing which maintains a heated fluid so that all thermal energy therein is conducted to the gas passing through it in the metal tubing;
a heated fluid which is contained in the double walled insulated chamber for heating the cold stream of gas prior to breathing selected from the group consisting of fresh water, sea water and ethylene glycol;
fins surrounding said Vortex tube for heat transfer which dissipate heat of the hot stream of gas passing through the Vortex tube prior to mixing with the heated cold stream;
a valve means connected to the outlet of said Vortex tube and the outlet of said inner section to control gas flow and temperature which allows optimum setting of cold stream volume and hot stream volume and mixes the two streams prior to breathing;
tube means to supply gas to the heater and carry gas for breathing that are adaptable to standard diving equipment to make the unit a plug-in system; and,
a protective housing to improve continuity of the heater's design and protect the exposed coiled tubing from damage while allowing ambient water to pass through for heat transfer with the cold stream inside the tubing.

3,898,979
SOLAR HEAT COLLECTOR

John J. Medico, Jr., 5331 Cape Leyte Dr., Siesta Key, Sarasota, Fla. 33581

Filed Mar. 20, 1974, Ser. No. 452,732
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **5 Claims**

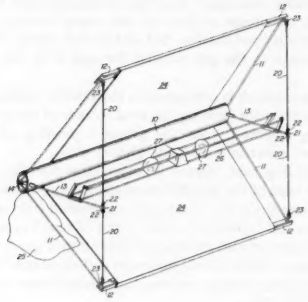


1. A solar heat collector for heating a fluid embodying a container, a layer of flexible insulating material in said container, a thin flexible sheet of metal resting upon said flexible insulating material, a fluid conducting coil of metal having a high thermal conductivity resting upon said thin sheet of metal deforming portions of said thin sheet of metal and forcing said deformed portions into said flexible layer of insulating material to cause intimate contact between the coil and said thin sheet of metal to allow heat transfer from the thin sheet of metal to the coil, and a transparent cover over the top of said container constructed of material which passes the maximum band width of solar spectrum to the coil.

3,898,980
OUTDOOR COOKING APPARATUS

Paul Eldren Reimann, 1014 E. Center St., Bountiful, Utah 84010

Filed Oct. 23, 1973, Ser. No. 408,325
Int. Cl. A21b *1/04*, *1/52*
U.S. Cl. 126—274 9 Claims



1. Collapsible, outdoor cooking apparatus, which can be used as a reflector oven for baking food and can also be used for grilling, frying and boiling, comprising an elongate, tubular member; two sets of three transversely extending radial members adapted for removable attachment, respectively, to opposite ends of the tubular member with the members of one set of radial members being parallel with the corresponding members of the other set of radial members; longitudinal rods connecting respectively, the free end portions of the outer members of one set of radial members to the outer members of the other set of radial members; and support members which connect the end portions of the outer members of each set of radial members to the end portion of the intermediate member of that set, said apparatus being used as a reflector oven by stretching a flexible, reflective material from one longitudinal rod, around the elongate tubular member, to attachment to the other longitudinal rod thereby providing reflective surfaces that diverge outwardly from the tubular member and, when faced towards a source of heat, concentrate baking or broiling heat in the area between said surfaces, and suspending a grill between the intermediate members to support food to be baked, and said apparatus being used as a stove for grilling, frying or boiling foods by suspending a grill or stretching a flexible material directly between the longitudinal rods as a cooking surface for horizontal positioning over a campfire or other heat source.

3,898,981
RESPIRATION MONITORING APPARATUS

Raymond B. Basham, Fort Worth, Tex., assignor to Electronic Monitors, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 176,983, Sept. 1, 1971, Pat. No. 3,760,794, which is a continuation-in-part of Ser. No. 97,737, Dec. 14, 1970, abandoned. This application Aug. 17, 1973, Ser. No. 389,268The portion of the term of this patent subsequent to Sept. 18, 1990, has been disclaimed.
Int. Cl.² A61B *5/08*
U.S. Cl. 128—2 R 6 Claims

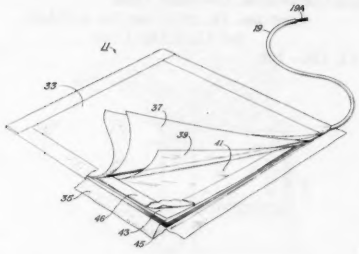
1. A system for monitoring a respiration rate of a patient, comprising in combination:

transducer means comprising: two electrically conductive plate electrodes, a center electrode positioned between two said plate electrodes, and

a single synthetic resin polymer sheet having a volume resistivity to maintain an electrostatic charge thereon covering the center electrode between the plate electrodes to thereby develop a current flow in said plate electrode and said center electrode varying with the patient's respiration rate,

circuit means responsive to the varying current flow in the two plate electrodes and the center electrode and generating an output voltage when the current flow is constant, and

alarm means actuated by said output voltage of said circuit means.



3,898,982
CAPILLARY TUBE FOR BLOOD EXAMINATION

Itsurou Katsuda, Tokyo, Japan, assignor to Jintan Terumo Co., Ltd., Tokyo, Japan

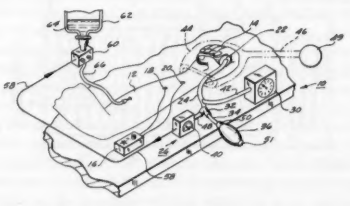
Filed Sept. 27, 1973, Ser. No. 401,175
Claims priority, application Japan, Sept. 29, 1972, 47-113033
Int. Cl.² A61B *5/14*
U.S. Cl. 128—2 F 9 Claims

1. A tube for blood examination which comprises a double open-ended capillary tube having an inner diameter which allows the introduction of blood by capillary action through the inlet end of the tube, at least one reagent coating layer coated on a portion of the inner wall surface thereof and spaced apart from said inlet end, and an uncoated inner wall area for the introduction of blood, which runs from said inlet end to an edge of the reagent coating layer.

3,898,983
DEVICE AND METHOD FOR DETECTING THE DEGREE OF MUSCLE RELAXATION OF A MEDICAL PATIENT

James O. Elam, 6723 S. Euclid Ave., Chicago, Ill. 60649

Filed Oct. 3, 1973, Ser. No. 403,017
Int. Cl.² A61B *5/05*
U.S. Cl. 128—2 N 13 Claims



1. A relaxation detector device comprising a stimulator means for electrically stimulating selected muscles of a living being and causing said muscles to flex, transducer means

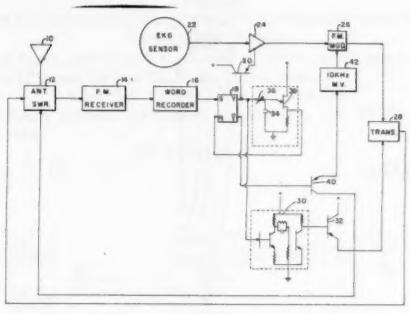
adapted to be associated with at least one of said selected muscles for converting the movement of said muscle into a signal which is a function of the amount of said movement, and holding means for holding against non-flexing movement a part of the body which is moved when said muscles flex, said holding means comprising a flexible, thin-wall gas-tight container shaped to enclose said body part and having a granular material therein, and means for removing gas from said container.

3,898,984

AMBULATORY PATIENT MONITORING SYSTEM

Louis Mandel; Algernon M. Ong, and Paul Singer, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 4, 1974, Ser. No. 439,199
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—2.1 A **3 Claims**



1. A system for automatically monitoring critical body functions of one or more ambulatory patients, the combination of:

a. an interrogating and monitoring station operating on a fixed frequency having means for generating and transmitting a plurality of digital coded interrogating signals and having means for receiving and displaying critical body function information received in response to said transmitted signal,

b. at least one patient transponder operating at said fixed frequency and having sensing means coupled to the patient for sensing at least one critical body function and being responsive to at least one of said digital coded interrogation signals for transmitting a signal containing said sensed critical body function, said patient transponder including;

c. a set reset flip-flop circuit having high and low voltage output terminals, set and reset input terminals,

d. a delay circuit coupled between said high voltage output terminal and said reset input terminal for providing a reset signal to said reset input after a predetermined time delay,

e. means coupled to said set input terminal for causing a high output from said high voltage output terminal,

f. means coupled to said sensing means and to said high voltage output terminal for causing the vital body information to be transmitted for the duration of the high output from said high voltage output terminal,

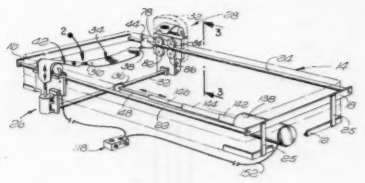
g. means coupled to said low voltage output terminal and being responsive to a high output from said low voltage output terminal when said reset signal causes the high output to go low and the low output to go high for generating a trigger signal that will initiate the next sequentially coded signal by said interrogating and monitoring station to be transmitted.

3,898,985

BODY MOTION SYSTEM

Julia A. Butcher, 1035 N. Glendale Ave., Glendale, Calif. 91206, and Daniel E. McLean, 7047 W. Franklin 102, Los Angeles, Calif. 90028

Filed Apr. 22, 1974, Ser. No. 462,910
Int. Cl. A61h *7/00*
U.S. Cl. 128—63 **5 Claims**



1. A body motion system comprising:

a movable support positioned in a generally horizontal plane along the axis of said support and having a central section which can subside in a plane perpendicular to said horizontal plane when a body or portion thereof is placed in said support;

means for coupling at least a first end of said support to a first motive force; and

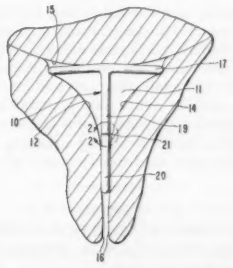
means for actuating said motive force to move said support in a lateral direction perpendicular to the axis of said support.

3,898,986

BIOTRANSFORMABLE INTRAUTERINE DEVICE

Alejandro Zaffaroni, Atherton, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Dec. 27, 1972, Ser. No. 319,014
Int. Cl. A61f *5/46;* **A61m** *31/00*
U.S. Cl. 128—130 **16 Claims**



1. A drug dispensing intrauterine device, shaped and adapted for insertion into the uterine cavity, with the device comprising in combination:

a. a drug

b. a delivery means adapted for insertion into the uterine cavity and for dispensing a therapeutically effective amount of drug to the uterine cavity over a defined period of time, and

c. retention means for retaining the delivery means within the uterine cavity throughout the defined period of drug dispensing time, said retention means having an initial unit structural configuration shaped and adapted for insertion and positioning in the uterine cavity including means for undergoing biotranformation in the uterine cavity to a different and non-uterine retentive configuration and shaped whereby at the completion of said defined period of drug dispensing time, said drug dispensing

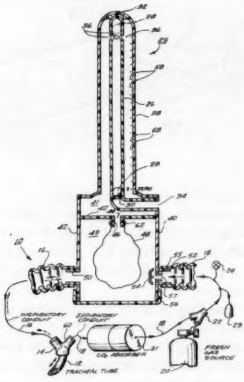
device is facilely removed or spontaneously eliminated from the uterine cavity.

3,898,987

BREATHING RESPONSIVE DEVICE AND METHOD

James O. Elam, 6723 S. Euclid Ave., Chicago, Ill. 60649

Filed Oct. 9, 1973, Ser. No. 404,728
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—145.8 13 Claims



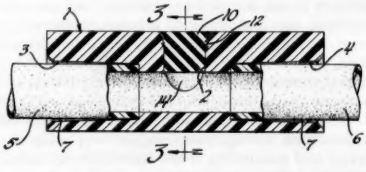
1. A breathing volume indicating device comprising gas conduit means for providing a substantially unimpeded guideway for a movable member, said conduit means having an elongated smooth internal surface, a movable gas-impervious lightweight member in said conduit means with a smooth outer surface and external dimensions slightly less than those of the interior of the conduit within relatively close tolerances so as to form a substantially gas-tight seal with said internal surface, means for communicating the pressure of breathing gases between a patient and said gas conduit means including means for isolating said internal surface and movable member from direct contact with said breathing gases, said isolating means further including a flexible membrane forming a chamber having a predetermined maximum volume, one side of said membrane communicating with said internal surface and said member, and the other side communicating with said gases, wherein said maximum volume is substantially equal to V, and V is given by the following equation: V T where T is the trachial-bronchial dead-space volume of the patient.

3,898,988

EXTRA CORPOREAL BLOOD ACCESS SITE

Brian E. Morgan, Wheatridge, Colo., assignor to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Apr. 22, 1974, Ser. No. 462,894
Int. Cl. A61m *05/00*, *01/03*; F16l *11/12*
U.S. Cl. 128—214 R 8 Claims



1. An extra-corporeal blood access site comprising a blood-passage tube of relatively rigid material having a cylindrical opening through a wall thereof and a cylindrical body of a relatively soft resilient needle-penetrable material in and sealing the opening in said tube, said body being under radially inward compression from substantially the entire cylindrical periphery thereof, said body having a compressive stress value (CSV) of from 8 to 10 calculated on the basis of the formula

$$CSV = R\ X[(D_1 - D_2)/D_1]$$

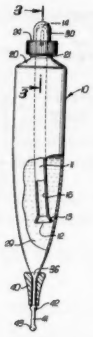
where R is the durometer resiliency on the Shore A scale of the material of said body, D_1 is the diameter of said body prior to insertion into said opening and D_2 is the diameter of said body after insertion into said opening.

3,898,989

HYGENIC SYRINGE UNIT

Robert J. Cox, 1653 W. 219th St., Torrance, Calif. 90251

Filed Apr. 29, 1974, Ser. No. 465,373
Int. Cl. A61m *1/00*
U.S. Cl. 128—232 10 Claims



1. A self-contained syringe unit for personal hygenic use comprising an elongated flexible walled container sealed at one end and provided at the other end with an annular neck member defining a restricted opening, the container being adapted to contain liquid, an elongated nozzle with an intake end and a major portion of its length disposed within the container and having a forward discharge end portion protruding through the annular neck member, the nozzle being adapted to be slidably extendible from the container and when extended forming with the annular member a substantially liquid tight joint, a cap adapted to enclose the protruding end portion of the nozzle, said cap being removably securable to the annular neck member and for cooperation therewith to form a liquid seal for retaining the contents of the container prior to use, said nozzle having discharge orifices opening radially outwardly, and means within the cap for resiliently engaging the orifices, whereby the nozzle may be extended from the container by pulling on the cap, and when the nozzle is fully extended an additional pull will release the cap from the nozzle, and whereby upon compression of the container liquid contents therein will be conducted through the nozzle for discharge therefrom.

3,898,990

OSTOMY SEAL AND METHOD OF MAKING THE SAME

John L. Nolan, Glenview, Ill., assignor to Hollister Incorporated, Chicago, Ill.

Filed Jan. 31, 1973, Ser. No. 328,324
Int. Cl. A61f *5/44*
U.S. Cl. 128—283 2 Claims

1. A seal adapted to be used in combination with an ostomy bag secured to a retainer with said retainer having an opening therein to surround the stoma of an ostomy patient, there being an annular contoured locating element formed around the periphery of said opening, said seal comprising a ring of

gelatinous material, said ring having an annular portion on one face thereof shaped complementary to said annular contoured locating element, a sheet of flexible substantially non-stretchable material covering said face of said ring, a second sheet of flexible substantially non-stretchable material covering the

other face of said ring, said sheets being heat sealed together around the inner and outer peripheries of said ring, and a pull tab having one end free and having its other end heat sealed to said second sheet whereby said second sheet may be removed from the ring by pulling on said tab.

3,898,991

ELECTROSURGICAL APPARATUS AND METHOD OF OPERATING SAME

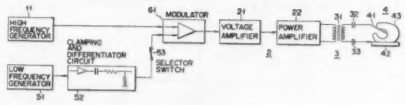
Yuji Ikuno, and Yutaka Kato, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1973, Ser. No. 424,433

Claims priority, application Japan, Dec. 20, 1972, 47-127805

Int. Cl. A61b *17/36*

U.S. Cl. 128—303.14 **11 Claims**



1. An electrosurgical apparatus comprising:

an electrosurgical knife which includes an active electrode and a fixed electrode;

a first oscillator means for generating a high frequency signal to control the knife;

a second oscillator means for producing a damped lowfrequency signal of lower frequency than said high frequency signal, said second oscillator means comprising a low frequency generator and a clamping and differentiator circuit means coupled to the output thereof to clamp the output signal of the low frequency signal generator at a given value and to differentiate it to produce said damped low frequency signal;

a modulator coupled to the output of said first and second oscillator means, the output of said modulator being coupled to said electrosurgical knife; and

a selector means having a first condition to cause said modulator to amplitude-modulate said high frequency signal by said damped low frequency signal and having a second condition to cause said modulator to couple said high frequency signal, unmodulated, to said knife.

3,898,992

ULTRASONIC SURGICAL METHODS

Lewis Balamuth, Southampton, N.Y., assignor to Ultrasonic Systems, Inc., Farmingdale, N.Y.

Division of Ser. No. 423,061, Dec. 10, 1973, Pat. No. 3,862,630, which is a division of Ser. No. 179,459, Sept. 10, 1971, Pat. No. 3,794,040, which is a division of Ser. No. 678,649, Oct. 27, 1967, Pat. No. 3,636,943. This application July 8, 1974, Ser. No. 486,401

Int. Cl.² A61B *17/04*

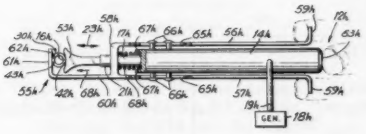
U.S. Cl. 128—334 **8 Claims**

3. A hand held instrument for joining together overlapping layers of tissue in vivo, comprising

A. a tool member having a working surface for contact with the surface of one of the layers of tissue to be joined,

B. transducer means operative to vibrate said working surface of the tool member at a high frequency of at least 5,000 cycles per second and low amplitude in directions perpendicular to said working surface,

C. support means having a support surface for contact with the surface of the opposite layer of tissue to be joined, and



D. means for mounting said support means with respect to said transducer means in a manner to permit relative displacement of said working and support surfaces towards and away from each other for engagement with the opposite sides of the overlapped layers of tissue for applying a compressive force thereto, wherein the layers of tissue are joined together by the combined action of the applied compressive force and ultrasonic vibrations.

3,898,993

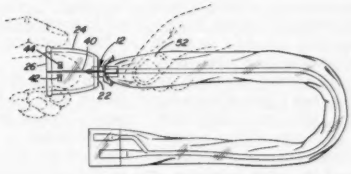
LUBRICATED CATHETER

Tokuso Taniguchi, 277 Kaiulani St., Hilo, Hawaii 96720

Continuation-in-part of Ser. No. 400,694, Sept. 25, 1973, Pat. No. 3,861,395. This application Sept. 17, 1974, Ser. No. 506,896

Int. Cl.² A61M *25/00, 7/02*

U.S. Cl. 128—349 R **10 Claims**



1. A catheter assembly for packaging in sterile condition within a removable protective envelope, said assembly including an elongated separable body having a longitudinal passageway formed therethrough open at its opposite ends, a catheter having its distal end telescoped into said passageway from one end thereof at one end of said body for subsequent projection of said catheter from the other end of said passageway, said body being provided with, on one side thereof, a longitudinally extending weakened zone and on the opposite side thereof longitudinally spaced and aligned slots, the connecting portions of said opposite side of said body disposed between adjacent ends of adjacent slots and the latter defining a second weakened zone extending longitudinally of said body, whereby said body may be parted along said weakened zones from about said body, and a tubular lubricant reservoir open at one end and having said one end removably telescoped over said distal end of said catheter and within said other end of said passageway, the other end of said tubular reservoir defining a lubricant receiving area and including means operative to cause displacement of said lubricant from said area toward said one end of said tubular reservoir and about said distal end of said catheter.

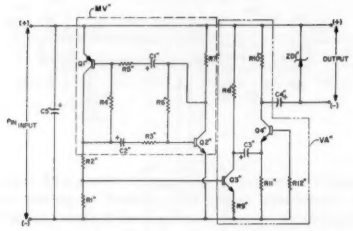
3,898,994
FIXED-RATE PACER CIRCUIT WITH SELF-STARTING CAPABILITY

Steve A. Kolenik, Leechburg, and William L. Johnson, Kittanning, both of Pa., assignors to Arco Nuclear Company, Leechburg, Pa.

Continuation-in-part of Ser. No. 109,857, Jan. 26, 1971, abandoned. This application Jan. 24, 1973, Ser. No. 326,473

Int. Cl. A61n *1/36*

U.S. Cl. 128—419 PG **4 Claims**



1. A heartpacer apparatus for generating electrical pulses from a constant voltage source for delivery to a pair of electrodes at least one of which is adapted to be connected to a heart to stimulate the heartbeat thereof, comprising:

a pair of transistors of opposite conductivity type, each having an emitter, base, and collector, the emitter of one transistor and the collector of the other transistor being connected to one terminal of said constant voltage source, and the collector of said one transistor and the emitter of said other transistor being connected to another terminal of said constant voltage source.

a pair of first resistance means, each having the same value, each connected between the base and collector of a respective one of said transistors, the value of each of said first resistance means being selected to normally bias the respective transistor to which said first resistance means is connected to a state out of saturation, and

a pair of second resistance means, each having the same value, and a pair of capacitance means, each having the same value, one of said second resistance means and one of said capacitance means being connected in series between the base of one of said transistors and the collector of the other transistor, and another of said second resistance means and another of said capacitance means being connected in series between the base of said other transistor and the collector of said one transistor,

whereby said first and second resistor means and said capacitance means define a multivibrator with said transistors for generating electrical pulses, said first resistance means assuring that the transistors are quiescently unsaturated and that the multivibrator is self-starting, and said second resistor means and said capacitance means controlling the duration of each pulse generated, and, in cooperation with said first resistance means, controlling the period between pulses.

3,898,995
NONCOMPETITIVE PACEMAKER WITH PROGRAMMABLE UNIJUNCTION TRANSISTORS

James Bernard Dresbach, 16885 Muirland, Detroit, Mich. 48221

Filed Mar. 25, 1974, Ser. No. 454,608

Int. Cl. A61n *1/36*

U.S. Cl. 128—419 PG **1 Claim**

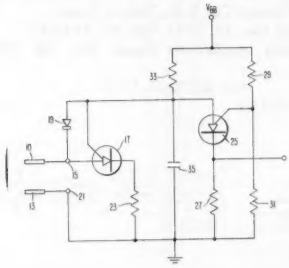
1. A noncompetitive pacemaker including a capacitor for providing stimulation pulses to the heart comprising:

means for charging said capacitor to a potential V;

means for receiving signals corresponding to intracardiac activity; said receiving means including a first and second electrode; said first and second electrode being suitable for connection to the heart;

a first

path for discharging said capacitor before said capacitor is charged by said charging means to said potential V; said first path including a first programmable unijunction transistor and a first resistor; said first programmable unijunction transistor having an anode, a cathode and a gate; said anode of said first programmable unijunction transistor being connected to said first electrode; said first resistor and said capacitor forming a series circuit connected between said gate and said cathode of said first programmable transistor; and



a second path for discharging said capacitor when said capacitor is charged by said charging means to said potential V; said second path including a second programmable unijunction transistor and a second resistor, said second programmable unijunction transistor having an anode, a cathode and a gate; said cathode of said second programmable unijunction transistor being connected to said first electrode; said second resistor and said capacitor forming a series circuit connected between said anode and said cathode of said second programmable unijunction transistor; said gate of said second programmable unijunction transistor being coupled to said potential V; said second electrode and said first and second paths having a common connection.

3,898,996
TOBACCO MOISTENING METHOD OPEN CORES

Richard Ernest Gartside Neville, Salisbury, and John Austin Garrett, Andover, both of England, assignors to AMF Incorporated, White Plains, N.Y.

Filed Feb. 1, 1974, Ser. No. 438,922

Claims priority, application United Kingdom, Feb. 8, 1973, 6357/73

Int. Cl.² A24B *1/02*

U.S. Cl. 131—136 **6 Claims**

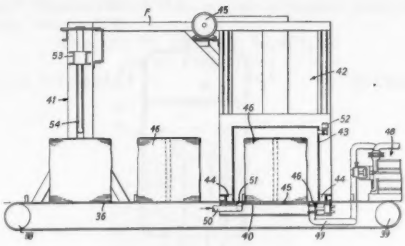
1. A process for moistening a body of tobacco, comprising the steps of:

a. placing the body of tobacco having at least one elongate cavity formed therein by cutting and removing the core, within an enclosed chamber;

b. evacuating the chamber;

c. thereafter introducing steam into the chamber; and

d. allowing the steam to pass into the tobacco, said tobacco being unsupported at the elongate surface of said cavity,



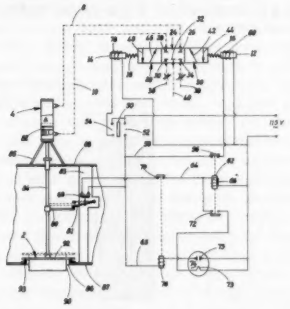
until the tobacco has received a predetermined quantity of moisture.

3,898,997

CONTROL ARRANGEMENT FOR A DAMPER

Wilson E. Kelley, Jr., Pleasure Ridge Park, Ky., and Robert Wright, Houston, Tex., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Mar. 18, 1974, Ser. No. 452,068
Int. Cl.[2] F16K *31/02*
U.S. Cl. 137—624.18 **5 Claims**



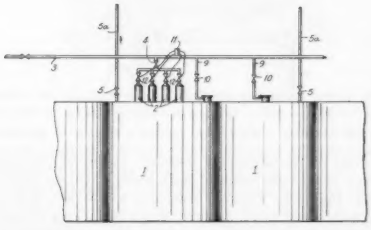
1. A damper control arrangement comprising:
a. a housing wall having an orifice therein;
b. a damper blade movably positioned selectively between at least one open position and a closed position in relation to said orifice;
c. damper blade moving means in communication with said damper blade for moving said damper blade relative to said housing wall;
d. actuating means operable to actuate said damper blade moving means for movement of said damper blade from one position to another, said actuating means including control means for said damper blade moving means actuated in response to a first control circuit and a second control circuit wherein (1) said first control circuit includes a normally open switch means closed to a first position, said switch means in said first closed position being in series with two branch circuits in parallel, the first of said branch circuits including a normally closed first contact switch and a first contactor actuating means whereby said first contactor actuating means actuates said actuating means to a first position upon closing said normally open switch, the second of said branches including a normally open limit switch and a first contact relay which operates said normally closed first contact switch, said normally open limit switch being operable in response to selected movement of said damper blade whereby when said damper blade moves a preselected distance said limit switch is actuated to a closed position thereby energizing said contact relay which opens said normally closed first contact switch, de-actuating said first contactor actuating means which in turn de-actuates said actuating means to its original position; and, (2) said second control circuit includes said normally open switch means closed to a second position and a second contactor actuating means whereby said second contactor actuating means actuates said actuating means to a second position upon closing said normally open switch means.

3,898,998

DEVICE TO COMPENSATE PRESSURE AND LOSSES OF INERT GAS

Alfred Billberg, Stockholm, Sweden, assignor to Lisnave-Estaleiros Navais de Lisboa, S.A.R.L., Lisbon, Portugal

Filed June 11, 1974, Ser. No. 478,356
Int. Cl. B65d *87/52*
U.S. Cl. 137—113 **10 Claims**



1. In a system for automatically compensating for losses of inert gas in a tank which contains a combustible liquid beneath the gas, supply pipe means communicating with said tank for supplying an inert gas thereto from a normal source of inert gas, discharge pipe means also communicating with said tank and carrying a vacuum valve means which automatically opens at a given pressure to admit air into said tank during discharge of the liquid contents thereof, an emergency source of inert gas under pressure, pressure detecting means communicating with the interior of said tank for providing a signal when the pressure of the inert gas therein drops to a value just above said given pressure, emergency valve means operatively connencted with said emergency source of inert gas under pressure and with said pressure detecting means for responding to said signal to assume an open position releasing inert gas from said emergency source, and pressure regulating valve means situated between said emergency valve means and said tank for controlling the pressure of the gas flowing from said emergency source into said tank in response to said signal from said pressure detecting means, said pressure regulating valve means automatically closing at a pressure slightly below said given pressure while remaining open at a pressure above said given pressure.

3,898,999

VALVE HAVING AXIALLY SEPARABLE MEMBERS

Jordan D. Haller, 2701 W. Alameda Ave., Burbank, Calif. 91505

Division of Ser. No. 307,351, Nov. 17, 1972, Pat. No. 3,839,741. This application July 25, 1974, Ser. No. 491,792
Int. Cl.[2] F16K *15/08*; **A61F** *1/22*
U.S. Cl. 137—512.1 **11 Claims**

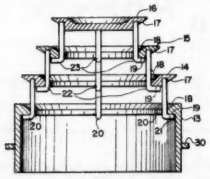
3. A valve comprising:
an outer ring member adapted to be secured within a passageway,
a central member and concentric ring members of progressively larger diameter surrounding the central member,

the outermost concentric ring member being surrounded by the said outer ring member,

all said members interfitting with each other to close off the passageway in a first end position of axial movement of said members,

said central member and concentric ring members being movable to a second end position with the central member fartherest, in an axial direction of fluid flow from the outer ring member and with the concentric ring member staggered axially, largest to smallest, respectively, from the outer ring member to the central member, to open the valve,

thin struts connected to each of the central member and concentric ring members and extending axially upstream from its respective member and operatively engaging the upstream side of a larger diameter member to limit axial



movement of its respective member at the second end position, said struts being of sufficiently small cross-section that they offer minimal resistance to the flow of fluid through the open valve, and said struts being long enough in the axial direction to permit its respective member to be spaced axially in the direction of fluid flow from the downstream end of the next larger member, thus providing between adjacent members an annular, substantially unobstructed opening for fluid flow,

wherein, at said open position, the interior of the valve within the staggered central member and concentric ring members defines a generally frustro-conical space in open communication at its larger base with the upstream side of the valve and in open communication with the downstream side of the valve through substantially unobstructed annular openings between the adjacent, spaced apart members.

3,899,000

LIQUID-VAPOR DISTRIBUTOR

Stanley Ohlswager; Robert R. Edison, both of Olympia Fields, and Thorpe Dresser, Markham, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Sept. 20, 1973, Ser. No. 399,204

Int. Cl. F16l *41/00*; F17d *1/00*

U.S. Cl. 137—561 A **11 Claims**

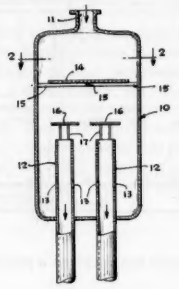
1. A distribution apparatus for distributing a mass of fluid comprising a liquid-vapor mixture into at least two separate streams which comprises:

1. a hollow vessel having at least one fluid inlet means;

2. at least two hollow distributor pipe means each having a top opening located at a first end of said pipe means which extends into said vessel, each of said pipe means providing outlet means from said vessel for a different portion of said fluid, provided that said fluid inlet means is located at a level above said top openings of said pipe means;

3. at least one aperture located in that part of each said pipe means extending to said vessel below said first end of said pipe means to provide fluid communication between the interior of said vessel and the hollow space of said pipe means; and

4. restrictive means located within said hollow vessel at a level above the top openings of said pipe means to restrict the flow of fluid from said fluid inlet means directly into



the hollow space of said pipe means through the top openings of said pipe means.

3,899,001

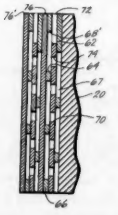
MULTI-PATH VALVE STRUCTURE

Myrl E. Orme, Canoga Park, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed June 6, 1974, Ser. No. 476,969

Int. Cl.[2] F16K *47/08*; F15B *21/04*; F15D *1/02*

U.S. Cl. 137—625.3 **14 Claims**



1. A valve comprising

a flow path including an opening to said flow path;

means for closing said opening in variable degree;

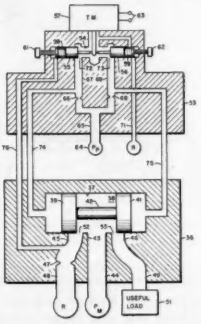
and means for dividing the flow through said opening into a plurality of streams comprising a stack of members across said opening having abutting faces including a first group of said members having passageways therethrough arranged in a series of patterns across the width of said members, said patterns including slots admitting flow into said stack only at certain intervals around the edges of said members, a second group of said members wherein a single member of said second group is interposed between two members of said first group, members of said second group having a series of orifices therethrough substantially smaller than said passageways and registering with said passageways, and including a pattern of slots admitting flow to said stack, said slots being radially displaced from the slots in said first group of members, each of said two members having its passageways in registry with the orifices in said single member but offset with respect to each other, and

a third group of said members which are imperforate and which abut against opposite faces of at least some of said first group of members to confine flow to a plurality of generally serpentine paths across said stack, said passageways defining chambers of cross-sectional area substantially exceeding the area of said orifices.

3,899,002
OPEN CENTER, PRESSURE DEMAND FLOW CONTROL VALVE

Paul F. Hayner, Gilford, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Oct. 18, 1973, Ser. No. 407,746
Int. Cl. F16k *31/363*
U.S. Cl. 137—625.62 **24 Claims**



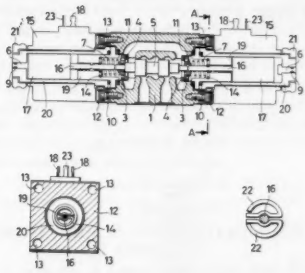
1. A valve system comprising, a fluid inlet connection, a fluid outlet connection, a fluid return connection, and apparatus for controllng the flow of fluid among said connections, characterized in that said apparatus comprises means for dividing the flow of fluid through said inlet connection so that one part flows through said return connection while the remainder flows through said outlet connection, said means comprising first and second fluid paths, said first path being connected between said inlet connection and said return connection, said second path being connected between said inlet connection and said outlet connection, said paths being independent of each other except for their common connection to said inlet connection, said first path including a first variable orifice and a flow sensing restrictor serially connected so that fluid may flow from said inlet connection, through said first variable orifice then through said restrictor to said return connection, whereby the pressure drop across said restrictor is the difference between the pressure of said return connection and the pressure upstream of said restrictor, said second path including a second variable orifice, a control system jointly responsive to an input signal and the pressure drop across said flow sensing restrictor for generating a control signal, and means responsive to said control signal for varying the sizes of said first and second variable orifice simultaneously in opposite directions.

3,899,003
FLUID DYNAMIC VALVE WITH DIRECT ELECTROMAGNETIC CONTROL WITH SLIDER-LATCHING DEVICE

Paolo Tirelli, Cinisello Balsamo (Milan), Italy, assignor to Atos Oleodinamica S.p.A., Milan, Italy

Filed May 10, 1974, Ser. No. 468,888
Claims priority, application Italy, Jan. 2, 1974, 19001/74
Int. Cl. F16k *31/06*
U.S. Cl. 137—625.65 **6 Claims**

1. An electromagnetic actuated hydraulic valve comprising a valve body having a plurality of channels for the flow of a hydraulic fluid, a slider mounted for sliding movement within said valve body to control the flow of fluid within said channels, electromagnet means mounted on said valve body and including an electric coiling, a cylinder fixedly secured to said body within said coiling, a fixed magnetic counter armature having a coaxial throughbore, a movable magnetic armature slidably guided within said cylinder, a pusher freely extending through said counter armature coaxial with said cylinder between said movable armature and said slider for transferring motion of said movable armature to said slider, said pusher having the shape of a cylindrical rod with at least one annular groove and being carried by said movable magnetic armature, said magnetic counter armature having in that end thereof remote from said movable armature a cylindrical axial cavity terminating at an inner end in a plane wall disposed normal to said pusher, resilient mechanical latching means at least partially seated in said cavity for permitting the sliding of said slider by said pusher in the axial direction under the action of said movable armature while ensuring the stoppage of said

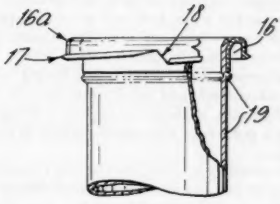


slider in certain predetermined positions when the thrust action of said movable armature ceases overcoming forces tending to axially displace said slider; said resilient latching means including a wire means disposed in a plane and being shaped to comprise two symmetrical substantially semicircular inner portions radially urged against said pusher passing therebetween so as to contact the major part of the circumferential surface of the pusher and being snapable into said annular groove thereof, and two symmetrical substantially semicircular outer portions, radially urged against the inner wall of the cylindrical cavity of said counter armature so as to contact the major part of the circumferential surface thereof.

3,899,004
CYLINDRICAL TUBULAR UNION PROVIDED WITH AN INTEGRAL PRESSING FORMED THREAD FOR THE ENGAGEMENT WITH A SCREW CAP

Mario Farelli, C.50 Giulio Cesare 298, Turin, Italy

Filed July 16, 1973, Ser. No. 379,797
Claims priority, application Italy, July 26, 1972, 69431/72
Int. Cl.[2] F16L *55/10*
U.S. Cl. 138—89 **1 Claim**



1. A tubular type union for automotive radiators comprising,

a duct branch having one end connected to a radiator,

a collar fixedly secured to the other end of said duct branch and adapted to engage a gasketed screw cap having a threaded inner surface,

a U-shaped crown formed on said collar for sealingly engaging the gasket of said screw cap,

an outwardly extending helicoidal flange disposed on the periphery of the end of the outer leg of said U-shaped crown,

and an interrupted section formed in said helicoidal flange which forms a screw thread adapted for engagement with said threaded inner surface of said cap.

3,899,005

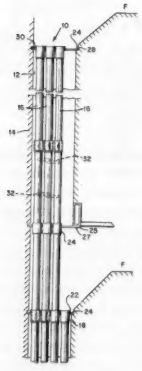
MODULAR DUCT SYSTEM FOR ELONGATED FLEXIBLE MEMBERS SUCH AS TELEPHONE CABLE OR THE LIKE

Fred Klimpl, West Orange, N.J., assignor to Fiberglass Resources Corporation, Farmingdale, N.Y.

Filed Aug. 6, 1973, Ser. No. 386,212

Int. Cl.[2] F16L *3/22*

U.S. Cl. 138—106 **5 Claims**



1. A modular duct system for feeding elongated articles such as telephone cables or the like within a vertical wall and between floors of a multi-story building, said duct system comprising;

a. a plurality of groups of resin bonded, filament wound glass fiber, tubular conduits with the conduits in each said group being arranged in a side-by-side array that defines a rectangular pattern in a plane transverse the longitudinal axes of said conduits and with said groups of conduits being arranged in a generally end-to-end relationship;

b. clip means for retaining said conduits of each said group in said array to thereby define a rigid bundle, said clip means comprising a first central plate having two pluralities of back-to-back and side-by-side arcuate segments integral therewith, each of said segments being arranged to engage a portion of the outside surface of one of said conduits;

c. means for coupling selected ones of said conduits in each said group in end-to-end, colinear relationship whereby the articles may be passed through a plurality of said selected conduits;

d. external, ring-shaped support means integral with said conduits for supporting said rigid bundles within the vertical wall of the building; and

e. second plate means having a plurality of apertures therethrough for receiving said conduits, said apertures being arranged in the same pattern as said array of conduits, said ring-shaped support means being in engagement with said second plate means whereby, when said second plate means is mounted on an abutment that is part of a building and is supported thereby, said conduits will be disposed along substantially vertical axes.

3,899,006

TUBES PROVIDED WITH CONNECTING FLANGES

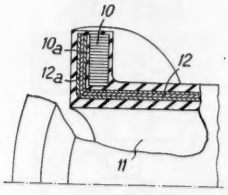
Jacques Champleboux, and Robert Delaux, both of Clermont-Ferrand, France, assignors to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, France

Filed Mar. 29, 1972, Ser. No. 239,193

Claims priority, application France, Mar. 29, 1971, 71.11034

Int. Cl. G01l *11/12*

U.S. Cl. 138—109 **22 Claims**



1. A pipe of rubber or analogous material having a reinforcement means provided therein and coupling flange means constituted by at least one ring means connected to the reinforcement means of the pipe, characterized in that the ring means is constituted by at least one series of concentric windings of a ribbon-like element wound along spirals superposed one upon the other and firmly joined with one another.

3,899,007

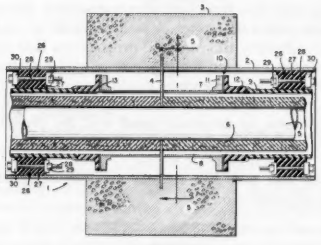
INSULATED PIPE ANCHOR ASSEMBLY

Randall J. Miller, 1051 Woodside Dr., West, Mobile, Ala. 36608

Filed Jan. 30, 1973, Ser. No. 327,906

Int. Cl.[2] F16L *9/14, 59/16*

U.S. Cl. 138—114 **3 Claims**



1. A pipe anchor assembly comprising:

a. a central conduit for high temperature fluid;

b. an insulating layer surrounding said central conduit;

c. radially extending anchor plates emanating from said central conduit and terminating in an outer anchor means at an anchor station;

d. a metallic sleeve affixed to said anchor plates surrounding said insulating layer and spaced therefrom to define an annular air space, the terminal ends of said metallic sleeve abutting an insulating gasket;

e. an outer metallic conduit;

f. metallic flanges connecting said terminal ends of said metallic sleeve and said insulating gasket;

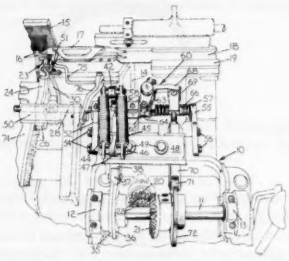
g. a discontinuous non-metallic casing adjacent said insulating layer having terminal ends spaced from said insulating gasket; and

h. insulating flanges connecting said terminal ends of said non-metallic casing and said insulating gasket.

3,899,008
WEFT CUTTER CONTROL APPARATUS

Edward S. Budzyna, E. Douglas, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed July 10, 1974, Ser. No. 487,005
Int. Cl.[2] D03D 47/36
U.S. Cl. 139—302 3 Claims



1. In a shuttleless loom in which weft yarn is inserted into the shed formed by warp yarns from a stationary source located outside of the shed and in which after insertion the weft is beat into the fabric fell by the loom reed and then trimmed by a cutter, the combination of improved cutter support means comprising:

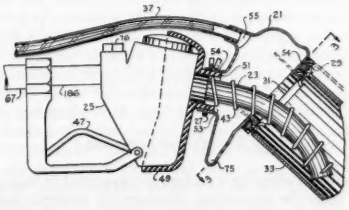
a. movable mounting means defining a longitudinal and rotary movable spring biased rod member for supporting the cutter for movement between an inoperative position outside of the path of travel of the loom reed and an operative position for cutting the weft yarn; and

b. drive means operably connected to said spring biased rod member and to a source of motive power for moving said spring biased rod member through longitudinal and rotary movements to affect positioning the cutter in said inoperative and in said operative positions alternately.

3,899,009
FUEL NOZZLE VAPOR RETURN ADAPTOR

John C. Taylor, 16 Cinnamon Ln., Portuguese Bend, Calif. 90274

Continuation-in-part of Ser. No. 269,826, July 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 256,534, May 24, 1972, abandoned. This application Feb. 1, 1973, Ser. No. 328,885
Int. Cl. B65b 31/06
U.S. Cl. 141—59 10 Claims



1. A vapor return system for collecting vapors associated with a filling operation comprising:

a fuel delivery system including a holding tank, fuel pumping means connected at one end thereof to said holding tank for pumping liquid from said holding tank, and nozzle means connected to the other end of said pumping means adapted for connecting with the inlet of a mobile storage apparatus;

boot means disposed around said nozzle means for sealably abutting said storage apparatus and containing the vapors therein, said boot means including an eccentrically annular magnet, an eccentrically annular ferromagnetic ring attached contiguously to one side of said annular magnet having an opening greater than the opening in said annular magnet, the respective openings in said magnet and ring cooperating to receive the free end of said boot, and a resilient sealing cover attached to the other side of said magnet;

vapor return means connected between said boot means and said holding tank for conducting vapors from said boot means to said tank;

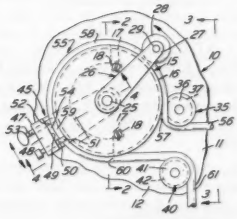
independently powered vapor pumping means included in said vapor return means for providing suction in said vapor return means at said boot means; and

a liquid seal connected between the suction side of said vapor pumping means and said holding tank for providing means for conduction of condensed vapors to said tank while maintaining a pressure differential thereacross substantially corresponding to the pressure differential across said vapor pumping means.

3,899,010
VOLUME CONTROL SYSTEM FOR LIQUID PACKAGING APPARATUS

Marvin S. Samson, 3 Locust Grove Rd., and Frederick W. Pfleger, 1152 Barbara Dr., both of Cherry Hill, N.J. 08003

Continuation-in-part of Ser. No. 287,988, Sept. 11, 1972, Pat. No. 3,807,131. This application Dec. 7, 1973, Ser. No. 422,678
Int. Cl.[2] B65B 3/26; F04B 43/08, 43/12
U.S. Cl. 141—250 8 Claims



1. Liquid packaging apparatus comprising support means, a tubing carrier on said support means, generally planar track means extending along said carrier, resilient flexible tubing having an intermediate region extending along and in the plane of said track means, the remainder of said tubing being out of said track means plane, tubing guide means for varying the length of said intermediate tubing region in said plane along said track means, one end of said tubing extending to fluid communication with a source of fluid to be packaged and the other end of said tubing extending to fluid communication with a packaging container, and roller means mounted for movement in the plane of and along said track means in rolling engagement with said intermediate region of tubing to displace a quantity of liquid to the container.

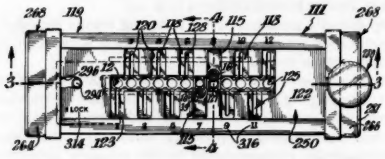
3,899,011
DISC DISPENSER

Alan C. Curtiss, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 281,946, Aug. 18, 1972, Pat. No. 3,832,532. This application Aug. 9, 1974, Ser. No. 496,287
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—325 21 Claims

1. A disc dispenser for dispensing discs from cartridges to a compartmented container having an array of compartments

having top openings for insertion of said discs, said dispenser comprising a base fixture, a dispensing table mechanism mounted upon said base fixture, said dispensing table mechanism having an array of upper and lower holes offset a predetermined distance from each other, cartridge-supporting means disposed on said dispensing table mechanism for holding said cartridges above said upper holes for successively dispensing discs into them, an apertured dispensing plate means mounted in said dispensing table mechanism for sliding movement from alignment with said upper holes to alignment with said lower holes, drive means connected to said dispens-



ing table mechanism for moving said dispensing plate means from one said alignment to the other whereby discs received from said upper holes are carried and dropped into said lower holes, a compartmented container-receiving chamber disposed under said dispensing table mechanism and within said base fixture for holding said compartmented container with its apertures aligned with said lower holes to cause said discs dispensed through said lower holes to drop into said compartments in said container, and auxiliary apertures in said dispensing table mechanism subatantially aligned with said lower holes to permit visual verification of dispensed discs and to facilitate clearing discs which may jam in said lower holes.

3,899,012

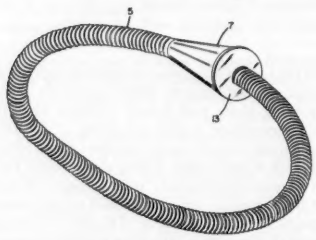
STAY CLEAN FUNNEL

Kenneth E. Sather, 3325 Trevis Way, Carmel, Calif. 93921

Continuation-in-part of Ser. No. 396,876, Sept. 13, 1973, abandoned. This application Jan. 21, 1974, Ser. No. 435,250

Int. Cl. B65b *39/00*

U.S. Cl. 141—331 **6 Claims**



1. A stay clean, no drip funnel comprising in combination:

A. an enlarged mouth end portion and a smaller tail end portion;

B. an elongated flexible tubular member forming a continuation of the tail end portion, said elongated member having a terminal end suitable for insertion in an orifice;

C. a cap having a central opening therein to permit mounting on the elongated flexible tubular member;

D. said cap adapted to snap over the large mouth end portion of the funnel;

E. said cap being mounted on said flexible member near said terminal end whereby said terminal end is free and extends beyond said cap for a sufficient distance to permit the same to be inserted in said orifice; and,

F. said terminal end can be inserted in the enlarged mouth end portion to provide a closed structure.

3,899,013

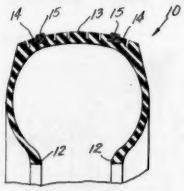
SAFETY TIRE TREAD INSERT

Henry E. Kruse, 23 Powder Horn Dr., Wayne, N.J. 07470

Filed June 8, 1973, Ser. No. 368,179

Int. Cl.[2] B60C *11/02, 11/14*

U.S. Cl. 152—208 **2 Claims**



1. A combination pneumatic tire and insert tread element comprising a pneumatic tire casing having a tire tread formed thereon, a circumferential groove formed in said tire tread and having a transverse cross-section with the inner portion of said groove wider than the outer portion thereof, a rubber tread ring seated in said groove and having a crosssectional shape to lockingly fit said groove with the outer surface of the ring protruding outwardly from the tire, said ring being formed of tread rubber having a mineral abrasive material uniformly distributed therethrough, so as to present its outer surface as a continuous, ring-like, ground engaging, abrasive friction surface having substantial breadth, said rubber ring being split with the opposite ends thereof provided with enlarged heads, and the groove in said tire being provided with complementary shaped recesses locking with said enlarged heads.

3,899,014

PNEUMATIC TIRE

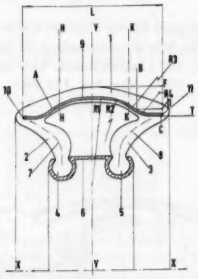
Edoardo Robecchi, and Giuseppe Tavazza, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Feb. 12, 1974, Ser. No. 441,769

Claims priority, application Italy, Feb. 22, 1973, 20684/73

Int. Cl. B60c *13/00, 9/18, 17/00*

U.S. Cl. 152—353 C **6 Claims**



1. A pneumatic tire for vehicles comprising

a tread,

an annular reinforcing structure incorporated in said tread, two sidewalls comprising eleastomeric material and terminating into beads intended to be encased in appropriate seats in the wheel rim, said sidewalls having in those sections of each plane containing the axis of rotation of the tire, a section midline whose convexity is directed towards the tire inside, said convexity being unchanged in sense under the thrust of tire inflation pressure,

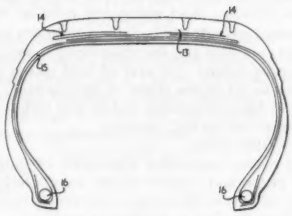
said annular reinforcing structure being substantially inextensible and defining contours, in proximity of the lateral edges of said tread, whose points are at a substantially

invariable distance, with respect to pressure variations, from the points defined by said beads in the same section planes, characterized in that said annular reinforcing structure, in the sections of each plane containing said axis of rotation, when the tire is inflated at its service pressure, has a profile whose curvature has its own concavity, at the structure's central portion, directed radially inwardly of the tire, while the concavity of the profile at the structure's lateral portions is directed radially outwardly of the tire.

3,899,015
PNEUMATIC TIRES

Karl Gebert, Klein-Auheim, and Otto Schmitt, Niedergrundau, both of Germany, assignors to Dunlop Limited, London, England

Filed June 12, 1973, Ser. No. 369,278
Claims priority, application Germany, June 19, 1972, 2229888
Int. Cl.² B60C *9/18*
U.S. Cl. 152—361 FP **8 Claims**

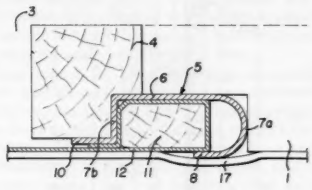


1. A pneumatic tire comprising a tread and carcass and, beneath the tread, a belt of substantially inextensible threads consisting of several at least partially superimposed plies, two of which are folded over to form folded edges one on either side of the center of the belt in which the first ply extends from a predetermined first outer peripheral line of the tire over the tire center to the opposite shoulder region, is there folded radially outwardly back upon itself and is conducted as far as a first inner peripheral line of the tire and the second ply has the same width as the first ply and extends fropm a second outer tire peripheral line, which lies symmetrically with the first outer peripheral line relative to the tire center, over the tire center to the opposite shoulder region, is there folded radially outwardly back upon itself and is conducted as far as a second inner peripheral line of the tire, which lies symmetrically with the first inner peripheral line of the tire relative to the tire center, the width of said two plies of the belt being selected so that on each side of the center of the belt the outer and inner peripheral lines substantially coincide, and the width of each of the folded-over portions of said two plies of the belt is greater than the width of the overlapping region between said inner peripheral lines.

3,899,016
DOORWAY SEALING DEVICE

Maynard Martin Bakken, 14-Chisholm Cres. N.W., Calgary 48, Alberta, Canada

Continuation of Ser. No. 223,230, Feb. 3, 1972, abandoned. This application Dec. 11, 1973, Ser. No. 423,776
Int. Cl.² E06B *5/00*; **B61D** *45/00*
U.S. Cl. 160—368 G **1 Claim**



1. In a bulk transporting container for particulate commodities having a wall with a doorway therein, a disposable, interior sealing means for the doorway comprising:

a. an elongated channel disposed coextensively adjacent said doorway and inside said container, said channel opening toward the interior of said container and including an end wall connected to the wall of said container, a first side wall displaced from said doorway, rigidly and coextensively connected to said end wall, a second side wall intermediate said doorway and said first side wall, rigidly, coextensively, and orthogonally connected to said end wall, and a lateral flange rigidly connected to said first side wall and extending toward said second side wall to restrict the width of the opening of said channel;

b. at least one locking member snappingly and removably held within said channel by said end wall, said second side wall, and the interior surface of said lateral flange, said locking member being removable from within said channel without damaging said channel and said locking member further remaining out of contact with said first end wall;

c. a plurality of flexible tension members extending across said doorway and rigidly secured to said at least one locking member, each tension member being of a length and composition which prevents deflection of a tension member sufficient for said tension member to contact the outer doors of said container if said tension member is subjected to pressure from within said container by said commodity; and

d. a diaphragm extending over the inside of said at least one locking member and said flexible tension members and covering said doorway to seal said doorway.

3,899,017
APPARATUS AND METHOD FOR ELECTROSLAG REMELTING

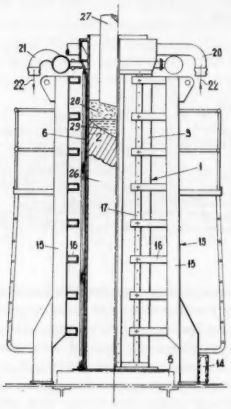
Edward Francis Beverley Croft, Sutton Coldfield, England, assignor to Associated Electrical Industries Limited, London, England

Filed Aug. 24, 1973, Ser. No. 391,318
Claims priority, application United Kingdom, Aug. 25, 1972, 39717/72
Int. Cl. B22d *27/02*
U.S. Cl. 164—52 **28 Claims**

1. A method of producing an ingot comprising the steps of:

a. providing an electroslag mould having a horizontal cross-section bounded by substantially straight side walls or side walls curved to a radius of not less than 600 mm., the said walls being relatively thin and reinforced by a multiplicity of vertically extending ribs disposed at spaced positions around the mould walls, each rib being secured to the outer surface of a mould wall throughout the length of the rib, and the

mould walls being surrounded by a rigid support structure which is spaced from the mould walls and secured to the ribs at spaced positions along their lengths such that thermal expansion of the mould walls is constrained to take place in local bowing between adjacent ribs;



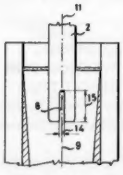
b. forming the ingot in the mould by the electroslag melting of at least one consumable electrode depending into a slag pool contained in the mould;
c. cooling the outer surfaces of the mould walls while the ingot is being formed; and
d. thereafter removing the ingot from the mould.

3,899,018

METHOD OF CASTING STEEL INTO A CONTINUOUS CASTING MOLD AND POURING TUBE FOR THE PERFORMANCE OF THE AFORESAID METHOD

Peter J. Koenig, Zumikon, Switzerland, assignor to Concast AG, Zurich, Switzerland

Filed Apr. 6, 1973, Ser. No. 348,850
Claims priority, application Switzerland, Apr. 14, 1972, 5554/72
Int. Cl.[2] B22D *11/10*
U.S. Cl. 164—82 **6 Claims**



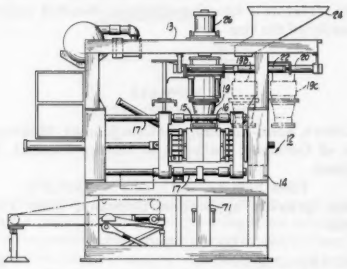
1. A pouring tube for pouring steel into a continuous casting mold to form a cast strand, said pouring tube having at least one outlet means capable of opening into the liquid metal pool of the mold for introducing liquid metal into the mold in the form of a thin, coherent pattern, said outlet means having the shape of a downwardly and laterally opening slot of constant width, the width of the slot not exceeding 25 millimeters and the length of the slot being about seven to nine times the slot width.

3,899,019

THREE-POSITION MOLDING MACHINE

Bengt I. Langne, Kewanee, Ill., assignor to Acme-Cleveland Corporation, Cleveland, Ohio

Filed June 9, 1972, Ser. No. 261,434
Int. Cl. B22c *15/24*
U.S. Cl. 164—201 **12 Claims**



1. A molding machine, comprising in combination, a frame, mold box means having a fill position,
guide means on said frame having a horizontal component, a chamber mounted on said guide means for movement between first, second and third positions,
means to supply mold material into said chamber with the chamber in said second position thereof,
means to transfer a charge of mold material from said chamber into said mold box means at said fill position with said chamber in said first position thereof,
and means to move said chamber among said three positions including fluid piston and cylinder means having extended and retracted relative conditions with one being a first condition and the other being a second condition, means to secure one end of said piston and cylinder means to act on the frame of the machine,
means to fasten the other end of said piston and cylinder means to act on said chamber,
fluid pressure means,
control means controlling application of fluid pressure to said piston and cylinder means to relatively move same from the first to the second condition to move said chamber from the first to the second position,
means to change the securing of said one end of the piston and cylinder means to a different position relative to said machine frame,
and said control means being actuable to relatively move the piston and cylinder means to move said chamber from said second to said third position.

3,899,020

METAL CASTING MOLD FOR CENTRIFUGAL CASTING MACHINE

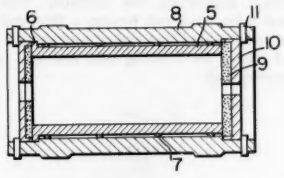
Yasuhiro Sekimoto, and Yoshitada Miura, both of Kitakyushu, Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Aug. 9, 1972, Ser. No. 279,654
Claims priority, application Japan, Aug. 11, 1971, 46-60321
Int. Cl. B22d *13/00*
U.S. Cl. 164—286 **5 Claims**

1. A metal mold assembly of double wall construction adapted to be used for centrifugal casting comprising:
an inner metal mold member,
an outer metal mold member concentrically provided around said inner metal mold member, said outer and inner metal mold members being concentrically spaced from one another at a dimension for minimizing the total tensile and thermal stresses in said inner and outer metal mold members, wherein said dimension is not less than about 0.13 percent of the outer diameter of said inner

metal mold member, and said outer and inner metal mold members being mounted with respect to each other for rotation about an axis concentric to said outer and inner members,

a plurality of plastically deformable spacing members spaced apart from each other and inserted between said inner metal mold member and said outer metal mold member for reducing vibration of said metal mold during casting operations and simultaneously for permitting



radial thermal expansion of said inner metal mold member free of distortion, and

a pair of end covers provided in contact only at opposite axial ends of said outer metal mold member, each of said end covers having on the inner face thereof a sand mold in direct contact with the opposing axial end of said inner metal mold member, said inner metal mold member being entirely prevented at one axial end from direct contact with said end covers so that axial expansion of said inner metal mold member is absorbed only by said sand mold.

3,899,021

MACHINE FOR CASTING METALS UNDER GAS PRESSURE

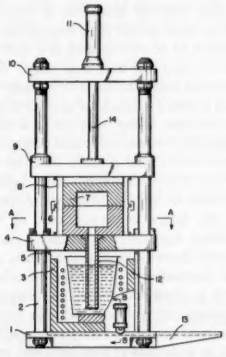
Alexander Damyanov Alexandrov; Todor Kostov Trifonov; Stefan Ivanov Stefanov; Paskal Spasov Apostolov, and Mincho Borislavov Deshev, all of Plaven, Bulgaria, assignors to Nipki "Leyarska Technika", Pleven, Bulgaria

Filed Sept. 1, 1972, Ser. No. 285,661

Claims priority, application Bulgaria, Sept. 2, 1971, 18483

Int. Cl. B22d *17/06*

U.S. Cl. 164—306 **3 Claims**



1. An apparatus for casting metal comprising:

a. pressurized reservoir means for a melt;

b. intermediate plate means positioned above said reservoir means, said intermediate plate means including a metal duct means extending into said reservoir means;

c. mould means positioned above said intermediate plate means, wherein said metal in said reservoir means passes into said mould means through said metal duct means;

d. column means having slot means therein;

e. movable plate means positioned above said mould means in a mould sealing relationship with said intermediate plate means, and locking means comprising guides fixed to said intermediate plate means and wedge means mounted on said column means, said wedge means being forced between said intermediate plate means, said slot means and said guides;

f. transfer cylinder means for holding said reservoir means, intermediate plate means, mould means, and movable plate means in the sealing relationship against the pressure in said reservoir means such that the pressure forces said melt into said mould means; and,

g. column means for supporting said intermediate plate means, said movable plate means, and said transfer cylinder means, said transfer cylinder means comprising a top plate fixed to said column means, a cylinder fixed to said top plate, and piston means extending from said cylinder and coupled to said movable plate means, said intermediate plate means and said movable plate means being movable on said column means.

3,899,022

METHOD AND PLANT FOR REGULATING TEMPERATURE BY MEANS OF A SUBTEMPERED AIR FLOW

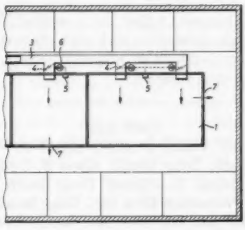
Sixten Ismael Persson, Stockholm, Sweden, assignor to Luftkonditionering AB, Stockholm, Sweden

Filed May 7, 1973, Ser. No. 357,741

Claims priority, application Sweden, May 9, 1972, 6092/72; Jan. 26, 1973, 7301146

Int. Cl. F24f *3/00*

U.S. Cl. 165—22 **2 Claims**



1. In the known combination of a system for regulating the temperature in a room that has at least one inlet duct for the introduction of tempered air, a damper in at least one inlet duct, said damper being designed to regulate the quantity of tempered air introduced into said room, the improvement which comprises:

a. each damper being mounted in the air duct with which it is associated so that the damper can only be disposed in two positions, said two positions consisting of a maximum air flow position and a minimum air flow position,

b. motor means operatively associated with each damper for moving said damper back and forth between said maximum air flow position and said minimum air flow position, and

c. temperature sensing means operatively connected to said motor means in such a way that a predetermined change in temperature of the air at a point downstream of the point where the air inlet duct enters the room will cause said motor means to move said damper to the other of its only two positions, and thus changing the flow rate of tempered air into the room.

3,899,023

EQUIPMENT FOR DRYING GAS, IN PARTICULAR AIR, BY REFRIGERATION

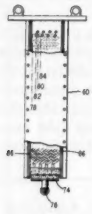
Bernd Zander, Kettwig; Bernt Borggrife, Hemsbach, and Horst Wortmann, Frondenberg-Ardey, all of Germany, assignors to VIA Gesellschaft fur Verfahrenstechnik, Dusseldorf, Germany

Filed June 21, 1973, Ser. No. 372,333

Claims priority, application Germany, July 1, 1972, 2232386

Int. Cl. F28b *1/00;* **F28f** *9/26*

U.S. Cl. 165—111 **4 Claims**



1. In an apparatus for drying gas, in particular air, by refrigeration, including a gas/gas heat exchange and a gas/refrigerant heat exchanger, said exchangers extending with their longitudinal axes in a vertical direction, a heat exchanger insert for at least said gas/refrigerant exchanger, said heat exchanger insert comprising a plurality of cooling coil elements being connected in parallel and combined into a closed package and having a plurality of cooling coil sections being bent in their longitudinal direction backwards and forwards in an S-like configuration and extending in a horizontal direction substantially in parallel, said sections further alternating with regard to the cross-section of a cooling coil element in a zig-zag manner between a first and a second plane, adjacent cooling coil elements meshing with each other so that immediately neighboring sections of adjacent cooling coil elements provide for a mutual support.

3,899,024

AUXILIARY OIL WELL TUBING SHUT-OFF ASSEMBLY

Gerald J. Tonnelli, Long Beach; Karol E. Epiling, Fountain Valley, and James R. Ahrens, Long Beach, all of Calif., assignors to Production Data Inc., Long Beach, Calif.

Filed Jan. 10, 1975, Ser. No. 539,941

Int. Cl.[2] E21B *33/03, 33/12*

U.S. Cl. 166—72 **8 Claims**

1. In combination with a pressurized oil well tubing string that extends upwardly through a bore hole to communicate with a valve having a first fluid discharge end, an auxiliary tubing string shut-off device that permits said valve to be removed from said tubing string for repair or replacement, or repaired while in communication with said tubing string free of fluid pressure, said device including:

a. a fluid shut off assembly that includes a tubular body having an engageable upper portion, an intermediate portion that defines a body shoulder, a tube depending from said intermediate portion; a resilient ring shaped packer that encircles the part of said dependent tube most adjacent said body shoulder; a finger defining cylindrical shell having first and second ends, said first end of said shell in contact with said packer; a nut secured to said second end of said shell; a rod that extends longitudinally through said body and shell, said rod having threads defined thereon that engage said nut; a head secured to the end of said rod most adjacent said engageable upper portion; first means for maintaining said head at a fixed longitudinal position relative to said body as said head and rod are rotated; and second means that prevent rotation of said shell relative to said body but permits longitudinal movement of said shell towards and away from said body as said rod is rotated by said head in opposite directions, said fluid shut-off assembly of such transverse cross section as to be movable into and out of said tubing string through said valve when the latter is in an open position;

b. a first tube having first and second end portions, said second end portion removably securable to said fluid discharge end of said valve;

c. a second tube longitudinally slidable and rotatable in said first tube said second tube having first, and second ends;

d. a socket supporting rod rotatably disposed in said second tube, said rod having a first end portion that projects from said first end of said second tube;

e. third means for rotating said first end of said socket supporting rod;

f. engaging means on said second end of said second tube that removably engage said engageable upper portion to removably support said fluid shut off assembly from said second tube; and

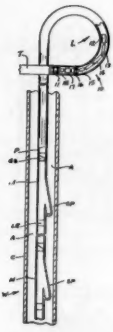
g. power means for forcing said fluid shut off assembly, second tube, socket supporting rod downwardly through said valve into said tubing string against the fluid pressure in the latter, with said socket supporting rod being rotated when said shut-off assembly is disposed in said tubing string and said socket is in engagement with said head in a direction to so rotate said rod connected to said head relative to said nut that said finger defining shell moves towards said body shoulder to radially expand said packer with the interior surface of said tubing string, said second tube thereafter being rotated in a direction to separate said engaging means from said engageable portion of said body to permit said second tube and socket supporting rod to be drawn upwardly into said second tube, said second tube thereafter being separated from said valve to permit the latter to be replaced or repaired, said valve after being replaced or repaired having said first tube connected thereto, said second tube and socket supporting rod thereafter being lowered relative to said tubing string to a position where said engaging means engage said engageable portion of said body and said socket engages said head, said socket supporting rod then being rotated in a direction that said nut engaging rod rotates and longitudinally separates said shell and body to the extent that said resilient packer contracts out of sealing engagement with the interior of said tubing string, said second tube, socket supporting rod and shut-off assembly being moved upwardly to dispose said shut-off assembly in said second tube, said valve now placed in a closed position, and said second tube and the balance of the elements comprising said shut-off device separated from said valve.

3,899,025

PUMP DOWN SYSTEM FOR PLACING AND RETRIEVING SUBSURFACE WELL EQUIPMENT

Robert W. Dinning, Houston, Tex., assignor to Macco Oil Tool Company, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 243,380, April 4, 1972, Pat. No. 3,799,259. This application Oct. 6, 1972, Ser. No. 295,684
Int. Cl. E21b 7/06
U.S. Cl. 166—117.5 22 Claims



1. A segmented assembly for handling well equipment of the type which is movable through a tubing string for longitudinal engagement with a side pocket recess of a side pocket mandrel comprising:

a. pressure actuated drive means connected with said assembly for driving said assembly through said tubing string in response to pressure applied to said drive means;

b. well equipment handling means connected in said assembly for handling and holding said well equipment;

c. position responsive stopping means in said assembly for automatically stopping said assembly at a predetermined location relative to a selected side pocket recess;

d. orienting means in said assembly for circumferentially orienting said assembly at a predetermined position relative to said side pocket recess; and

e. flexible joint means connecting one end of said handling means to said stopping means and the other end of said handling means to said orienting means whereby said assembly may flex to move through curved sect-ons of said tubing string.

3,899,026

USE OF THERMAL INSULATING FLUIDS IN WELLS

John D. Culter, Asheville, N.C., assignor to Continental Oil Company, Ponca City, Okla.

Filed Mar. 27, 1974, Ser. No. 455,446
Int. Cl.[2] E21B 43/00, 43/24
U.S. Cl. 166—302 3 Claims

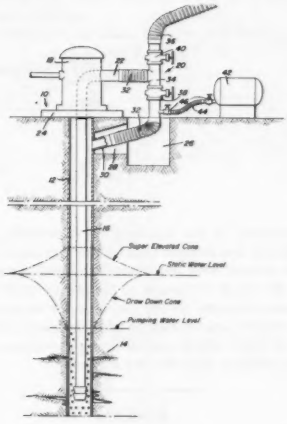
1. A method of thermally insulating an annular space between the borehole of a well and a conduit therein comprising providing in said annular space a suspension comprised of ultra finely divided silica having a particle size of less than 0.1 micron in an oil having low thermal conductivity, said silica being present in an amount of from 0.15 to 1.0 pounds per gallon.

3,899,027

METHOD OF CLEANING AND STIMULATING A WATER WELL

Jerold D. Jenkins, 404 Mills, Dumas, Tex. 79029

Continuation of Ser. No. 47,832, June 19, 1970, abandoned. This application Apr. 19, 1974, Ser. No. 463,044
Int. Cl. E21b 43/00, 43/27
U.S. Cl. 166—302 6 Claims



1. The method of cleaning and stimulating a water well of the type including an outer casing extending downwardly into an aquifer and perforated at the level of the aquifer and with the well casing being closed at its upper end by a support pad and having a central discharge tubing extending downwardly through the pad and the casing to at least the perforated area of the casing with the outer surface of the tubing spaced from the inner surfaces of the casing, said method including the steps of digging a pit downwardly alongside the pad to a level therebelow and tunneling inwardly to the casing at a point adjacent but below said pad, forming an opening in said casing at the inner end of the tunnel formed, establishing a recycling line extending from the upper discharge end of said tubing above said pad to said opening and with the recycling line in sealed communication at its opposite ends with said tubing and the portions of said casing disposed about said opening, causing water to be pumped upwardly through said tubing from the lower end thereof, through said recycling line and to be freely discharged into said casing through said opening for free falling downwardly through said casing exteriorly of said tubing and impact with the water standing in said casing in said aquifer about said tubing and thereby generate energy waves in the water within the casing and aquifer to greatly enhance the cleaning action and selectively introducing cleaning chemicals into the recycling water.

3,899,028

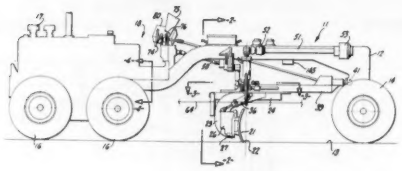
ANGULAR POSITION SENSING AND CONTROL SYSTEM, APPARATUS AND METHOD

Harold D. Morris, and Frederick J. Sigworth, both of Orinda, Calif., assignors to Systron Donner Corporation, Concord, Calif.

Continuation-in-part of Ser. No. 239,660, March 30, 1972, abandoned. This application Aug. 28, 1973, Ser. No. 392,257
Int. Cl. E02f 3/76
U.S. Cl. 172—4.5 50 Claims

1. In an angular position sensor and attitude control system for controlling the tilting movement relative to a local horizontal reference of one part of a machine having a framework when the framework of the machine shifts its position relative to the reference as the machine moves relative to a surface,

means carried on the machine for supplying an input reference command for control of movement of said one part, means mounted on the machine for receiving the input command, sensing means carried by said one part to sense the tilting movement of said part, said sensing means including a linear accelerometer having its sensitive axis at right angles to the axis of the tilting movement and an angular accelerometer with its sensitive axis parallel to the axis for tilting movement,



means mounted on the machine for combining the outputs from the linear and angular accelerometers and comparing the combined outputs with the input command at said means for receiving the input command to supply an error signal therefrom, means mounted on the machine for receiving the error signal for and means carried on the framework driven by said mechanical force which causes tilting movement of said one part in accordance with the error signal.

3,899,029

ROTARY HARROWS

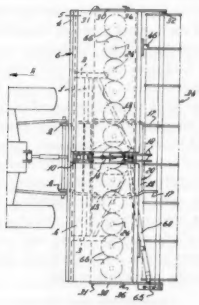
Ary Van Der Lely, 10, Weverskade, Maasland, and Cornelis Johannes Gerardus Bom, 36, Esdoornlaan, Rozenburg, both of Netherlands

Filed May 3, 1973, Ser. No. 356,840

Claims priority, application Netherlands, May 8, 1972, 7206172

Int. Cl. A01b *33/00*

U.S. Cl. 172—50 **17 Claims**



1. A rotary harrow comprising frame means including a forward coupling frame and a transverse frame portion supporting a plurality of tines soil working members, drive means connected to said soil working members to rotate same about upwardly extending axes, said transverse frame portion being interconnected to linkage means and the latter including said forward coupling frame, said frame portion being pivotally coupled to said forward coupling frame and vertically displaceable relative to said coupling frame, the rear of said linkage means being affixed to said frame portion, a soil contacting supporting member located to the rear of said frame portion and said supporting member being adjustably fastened to said frame portion, said frame portion together with said supporting member being vertically displaceable to match ground undulations independently of said forward coupling frame.

3,899,030

SOIL COMPRESSING MEMBERS

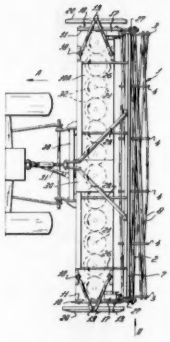
Ary van der Lely, 10, Weverskade, Maasland, and Cornelis Johannes Gerardus Bom, 36, Esdoornlaan, Rozenburg, both of Netherlands

Continuation of Ser. No. 208,698, Dec. 16, 1971, abandoned. This application Sept. 4, 1973, Ser. No. 394,279

Claims priority, application Netherlands, Dec. 18, 1970, 7018468

Int. Cl. A01b *9/00, 33/16*

U.S. Cl. 172—68 **11 Claims**



1. An agricultural implement comprising a rotary harrow with a frame supporting a plurality of side-by-side rotable soil-working members, said soil-working members being rotatable about upwardly extending axes and having downwardly extending tines, a supporting roller connected to said frame, said roller being rotatable about a substantially horizontal axis that extends transverse to the direction of travel at the rear of said soil-working members, said roller including spaced apart supports and a plurality of elongated elements helically wound around said supports and said axis of rotation, the lengths of said elements extending at substantially equal distances from said axis, said supports having aperture means around their outer peripheries that receive said elements and said elements comprising the outer soil contacting surface of said roller, the diameter of said roller being substantially equal to the distance between the upwardly extending axes of adjacent soil-working members, said supports including an outer support at each end of the roller and a plurality of further intermediate supports, each elongated element having opposite ends connected to the outer supports and said ends being positionable to subtend an angle that is substantially twice the angle subtended by the ends of successive elements on each outer support, said angle being measured with respect to said axis of rotation of the roller when said roller is seen in side elevation, said roller being connected to the harrow through arm means to support same and control the working depths of said soil-working members, said arm means and roller being vertically adjustable with respect to said frame.

3,899,031

VAPOR GENERATOR

Rudolf R. Laessig, West Chester, Pa., assignor to General Electric Company, New York, N.Y.

Filed June 17, 1974, Ser. No. 479,886

Int. Cl.[2] F22B *27/08*

U.S. Cl. 122—250 R **4 Claims**

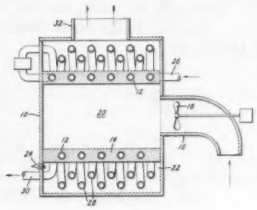
1. A vapor generator for vaporizing a liquid by burning a combustible mixture while minimizing the production of car-

bon monoxide, unburned hydrocarbons and nitrogen oxides comprising:

a housing having a central inlet for receiving the combustible mixture and an exhaust port in the housing wall;

a first coil of tubing for carrying the liquid contained in a porous wall;

said porous wall dividing the interior of said housing into a central plenum and a combustion chamber;



a second coil of tubing in said combustion chamber spaced from said porous wall wherein said liquid is vaporized;

the outlet of said first tube being connected to the inlet of said second tube;

means for introducing a combustible mixture into said plenum at a pressure higher than atmospheric; and

means for igniting said combustible mixture in said combustion chamber.

3,899,032

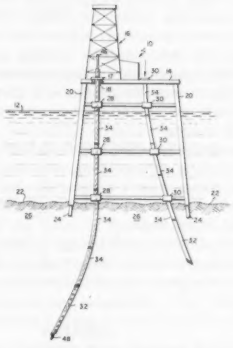
METHOD AND APPARATUS FOR DEVIATING CONDUCTOR CASING

Thomas E. Rees, Tulsa, Okla., and Frank D. Priebe, Houston, Tex., assignors to Cities Service Oil Company, Tulsa, Okla.

Filed Mar. 15, 1974, Ser. No. 451,614

Int. Cl.[2] E21B *15/02*

U.S. Cl. 175—9 **24 Claims**



1. A marine structure anchored in an offshore body of water for deviating conductor casing, or the like, comprising a drilling deck having at least one drilling aperture and situated above said body of water, at least one leg supportably attached to said drilling deck and extending downwardly to the bottom of said body of water, a pile means slideably guided by said at least one leg and connected to said structure for imbedding in the substratum of said body of water to rigidly secure said structure in place, and at least one first conductor casing slideably situated within said drilling aperture for insertion and bending beneath said bottom and in said substratum, said first conductor casing including a structure defining a conduit having a beveled end and a shoe member attaching to said beveled end and entirely covering the opening thereof, said beveled end of said first conductor casing bends in said substratum when driven into said same.

3,899,033

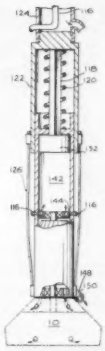
PNEUMATIC-KINETIC DRILLING SYSTEM

Allen T. Van Huisen, 29456 Indian Valley Rd., Rolling Hills Estates, Calif. 09274

Filed Jan. 3, 1974, Ser. No. 430,643

Int. Cl.[2] E21B *3/12, 5/00*

U.S. Cl. 175—97 **19 Claims**



1. A fluidic-kinetic drilling system comprising in combination:

a downhole assembly comprising:

a rotatable drilling bit;

fluidic means for rotating the drilling bit;

a fluidic power source means responsive to kinetic reciprocation for actuating the fluidic means;

suspending means extending from the surface for suspending the downhole assembly adjacent the bottom of a bore hole; and

means connected to the suspending means for reciprocating the fluidic power source means.

3,899,034

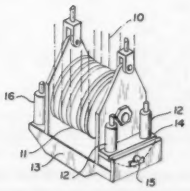
WEIGHING SYSTEM

Karl Polen, and J. C. Ottle, both of Alliance, Ohio, assignors to The Alliance Machine Company, Alliance, Ohio

Filed Dec. 6, 1973, Ser. No. 422,551

Int. Cl. G01g *23/02*

U.S. Cl. 177—151 **5 Claims**



1. A weighing system for material handling apparatus comprising a plurality of fixed load cells and a plurality of movable load cells, said fixed cells and said movable cells being opera-

bly connected to form a three-point system, each of said fixed cells being one of two legs of the system and one or more of the movable cells being said third leg, said cells being in operable contact with the load bearing surfaces of said material handling apparatus, means connecting said cells to an averaging device, and means for recording said average.

3,899,035

FACSIMILE TRANSMITTING RECEIVING SYSTEM WITH FIBRES HAVING A CONDUCTIVE COATING

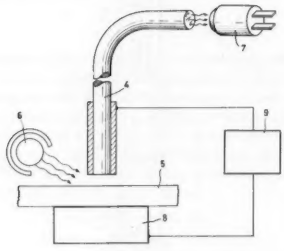
Ulf Rothgordt, Bargkoppel, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,440

Claims priority, application Germany, Jan. 12, 1973, 2301335

Int. Cl. H04n *1/24*

U.S. Cl. 178—6.6 A **7 Claims**



1. In a facsimile transmitting and receiving system of the type having electrostatic printing means for recording facsimile signals on a record sheet and optical scanning means for reading a subject copy, the improvement wherein the same styli used during electrostatic printing are also used during optical reading, each of said styli comprising: an optically conducting glass fibre for optically transmitting luminance values of elemental areas of a subject copy adjacent one end thereof to an optoelectronic transducer; and an electrically conductive coating surrounding said fibre at least at said one end thereof for conducting electrical pulses to said one end in order to electrostatically charge elemental areas of a record sheet adjacent thereto.

3,899,036

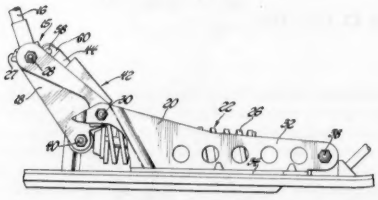
SNOWMOBILE SKI SUSPENSION ASSEMBLY

Harold E. Hollnagel, 10229 N. River Rd. 43W, Mequon, Wis. 53092

Filed Nov. 12, 1973, Ser. No. 414,900

Int. Cl.[2] B62M *27/00*

U.S. Cl. 180—5 R **29 Claims**



1. A suspension assembly adapted for attachment between the vehicle ski and the vehicle body of a skisupported vehicle comprising: support means, lever arm means pivotally attached to said support means, resilient means operably connected betwen said lever arm means and said support means for resisting the pivotal motion of said lever arm means, pivotal attachment means for providing pivotal attachment of said lever arm means to the vehicle body, lost motion connection means bridging said pivotal attachment means for limiting the pivotal motion between said pivotal attachment means and said assembly, and mounting means for attaching said support means to the ski.

3,899,037

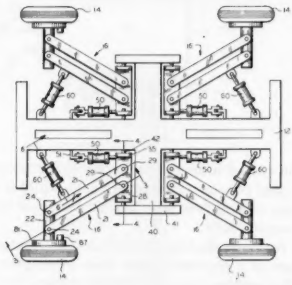
CHASSIS APPARATUS FOR ALL TERRAIN VEHICLES

Paul A. Yuker, 1408 Josephine St., Waukesha, Wis. 53186

Filed July 16, 1973, Ser. No. 379,250

Int. Cl.[2] B62D *11/02;* **B60S** *9/12*

U.S. Cl. 180—6.48 **13 Claims**



1. A vehicle comprising:

longitudinally extending frame means,

at least three movable linkage means connected respectively to said frame means and extending from opposite sides of the longitudinal direction of said frame means,

ground engaging means affixed to each of said linkage means remote from said frame means for supporting said chassis,

first operating means comprising first extensible cylinder means articulatingly coupled with each of said linkage means for independently moving said linkage means horizontally relative to said frame means, and

second operating means comprising second extensible cylinder means operatively coupled with each of said linkage means for independently moving said linkage means vertically relative to said frame means, said second cylinder means each having one end pivotally connected to said frame means and their opposite end coupled to said linkage means

rocking means associated with each of said linkage means, said rocking means being pivotally supported on said frame means about a generally horizontally extending axis which is perpendicular to the longitudinal direction of said frame means,

said linkage means each being pivotally connected to their respective rocking means about axes generally perpendicular to the pivot axis of said rocking means.

3,899,038

GAUGE WIDTH ADJUSTMENT MEANS FOR TRACK-TYPE VEHICLES

Bobby D. Griffith, and August H. Bertram, both of Aurora, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

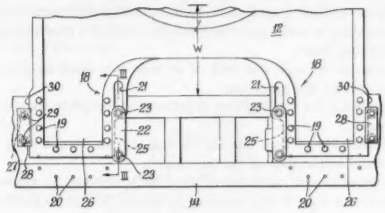
Filed May 31, 1974, Ser. No. 474,976

Int. Cl. B62d *55/00*

U.S. Cl. 180—9.48 **9 Claims**

1. In a track-type vehicle comprising a main frame, a pair of laterally spaced track roller frames mounted beneath said main frame and releasable fastening means normally securing said track roller frames to said main frame at a maximum gauge width between said track roller frames, the invention comprising adjustment means, including first and second alignment means disposed in parallel relationship and trans-

versely relative to a longitudinal axis of each of said track roller frames, operatively connected between overlying portions of said main frame and at least one of said track roller



frames for permitting selective narrowing of the gauge width between said track roller frames upon release of said fastening means.

3,899,039

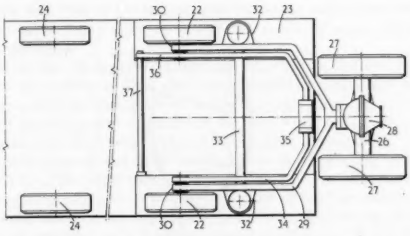
BUS HAVING A SEPARATE WHEELED MOTIVE POWER UNIT

John McHugh, 15 Cobbs Brow, Newburgh, England

Filed Feb. 22, 1973, Ser. No. 334,547

Int. Cl. B60d *3/00*

U.S. Cl. 180—11 **2 Claims**



1. A bus having a wheeled steerable body for accommodating a driver and passengers, a steerable wheeled motive power unit, and coupling means coupling the power unit to the rear of the body whereby the power unit may move relative to the body only in a substantially vertical direction the coupling means comprising first and second U-shaped suspension arms the ends of each limb of each of which are pivotal about the axis of rotation of the rear wheels of the steerable body, a pair of spring means arranged between the steerable body and respective ones of the limbs of the first suspension arm, an extension arm extending from the end of one of the limbs of the second suspension arm, and a transverse rod connected at one end to the free end of the extension and at the other to the steerable body, the second suspension arm being pivotally connected intermediate its ends to the underside of the steerable body.

3,899,040

VEHICLE FRAME AND DRIVE TRAIN

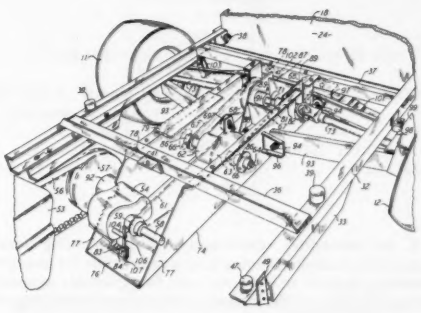
William L. Figura, Bruce, Wis., assignor to Jacobsen Manufacturing Company, Racine, Wis.

Filed Sept. 18, 1974, Ser. No. 507,004

Int. Cl.[2] B62D *61/08;* **B60K** *17/16*

U.S. Cl. 180—27 **10 Claims**

1. A vehicle frame and drive train assembly for a vehicle, comprising a vehicle frame, an engine supported by said frame, a transmission supported by said frame and being in driven relation with said engine, a U-shaped pan member attached to said frame and being elongated in the fore-and-aft direction of the vehicle, two rotation bearings mounted on said pan member in axially aligned positions with each other and on respective opposite sides of said U-shaped pan member, a differential having a shaft rotationally supported in said bearings, two additional rotation bearings supported by said pan member in axially aligned positions with each other and disposed relative to respective opposite sides of said U-shaped



pan member and rearwardly of said differential with respect to the fore-and-aft direction of the vehicle, a wheel axle rotatably supported by each of said additional rotation bearings and extending therefrom to respective opposite sides of the vehicle, a ground-engaging wheel connected with the extending end of each of said axles, and drive connections extending from said transmission to said differential and from said differential to said axles, for driving said wheels.

3,899,041

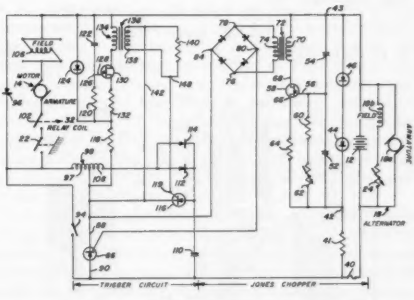
ELECTRIC VEHICLE

Charles J. Mager, Box 353 A, R.D. 4, Quakertown, Pa. 18951

Filed Oct. 23, 1970, Ser. No. 83,448

Int. Cl. B60l *11/18, 7/12, 15/08*

U.S. Cl. 180—65 R **7 Claims**

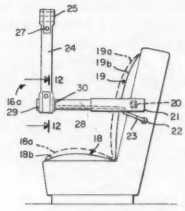


1. In an electric vehicle having at least one driving motor, a control system for the motor comprising a source of DC voltage, means inverting the DC voltage to pulsating voltage for energizing the motor, switch means connecting the inverting means to the motor for energizing the motor, generator means physically connected to the motor, the generator means usually being in a no-load free-wheeling state, and braking means connecting the source and the input of the generator means for causing the energization thereof which results in the dynamic braking of the motor.

3,899,042
AUTOMOBILE SEAT AUTOMATIC PASSENGER-SECURING DEVICE

George D. Bonar, 160 Bleecker St., New York, N.Y. 10012

Filed Apr. 29, 1974, Ser. No. 464,791
Int. Cl. B60r 21/10
U.S. Cl. 180—82 C 13 Claims

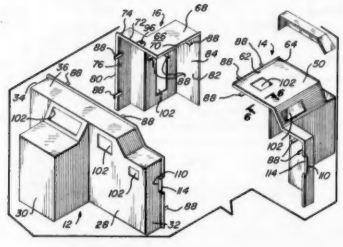


1. An automotive vehicle-seat passenger-securing device comprising in combination: a mounting structure for pivotably mounting thereon an elongated arm; first pivotable mounting means mounted on the mounting structure and providing for controlled intermittent pivoting to and fro on the mounting means, of an elongated arm means between withdrawn and extended locked states and positions; said arm means including a first elongated arm means pivotably and controllably mounted by the mounting means on the mounting structure; a second elongated arm means mounted at about a distal end of the first elongated arm means and pivotably along a plane substantially transverse and normal to an axial longitudinal axis of the first elongated arm means, the second elongated arm means including lock-release structure such that a distal end of the second elongated arm means is pivotable downwardly to a substantially horizontal state from an upright position whenever the first elongated arm means is positioned in an extended state and position extending substantially horizontally in a horizontal state.

3,899,043
MACHINE COVER

Guy E. Hall, Denver, Colo., assignor to Steadley Company, Inc., Carthage, Mo.

Filed July 29, 1974, Ser. No. 492,537
Int. Cl.[2] E04B 1/82
U.S. Cl. 181—33 K 17 Claims



1. A noise-reducing and pollution-controlling machine cover comprising:

a plurality of free standing shells adapted to be secured together to enclose a processing machine;

each shell being formed of substantially rigid translucent material with the major portion of its internal and external surface areas free of opaque attachments or coatings; the lower margin of each shell lying generally in a horizontal plane for supporting contact with a floor, with the upstanding side margins and upper margins lying in vertical planes and sized and shaped to register with the opposed margins of adjacent shells;

means to detachably secure the shells together with their opposed corresponding margins in registry into a unitary noise-reducing enclosure encompassing the machine and standing in self-supporting contact with the machine-supporting floor;

apertures through the wall of at least one shell to provide access to the machine;

and shields for each of said apertures to complete the enclosure;

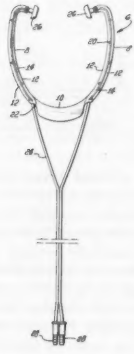
at least one of said shields having a transparent area for visual inspection of the machine;

the translucent material of the shells serving to transmit exterior light to the interior of the enclosure to facilitate such visual inspection.

3,899,044
MUSIC STETHOSCOPE

Elmer J. Stumpf, Los Angeles, and Allan D. Mockabee, Palmdale, both of Calif., assignors to Michaud, Inc., Los Angeles, Calif.

Filed Mar. 27, 1974, Ser. No. 455,402
Int. Cl.[2] A61B 7/02
U.S. Cl. 181—135 5 Claims

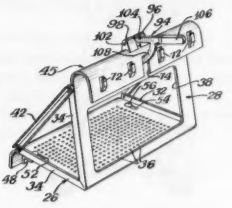


1. A stethoscope comprising a generally U-shaped body having spaced legs and a connecting bridge, each leg comprising a resilient element V-shaped in cross section to provide a sound tube trough, each leg being composed of two acutely angled wall elements joined at their inner side edges and having free outer side edges, a series of lugs disposed at spaced points along the outer side edges and extending laterally inwardly therefrom so as to extend partially over the V-shaped trough, said bridge being flat in plane substantially the same as the plane defined by the longitudinal axis of said legs, the bridge constituting a stiffening element between the flexible legs, and sound tubes lying in the V-shaped trough and partially beneath said lugs.

3,899,045
LADDER PLATFORM

Anthony Geisel, 5219 N. Spaulding Ave., Chicago, Ill. 60625, and Bohdan Rohowsky, 5238 W. Potomac Ave., Chicago, Ill. 60651

Filed May 3, 1974, Ser. No. 466,788
Int. Cl.[2] E06C 5/32, 7/00
U.S. Cl. 182—121 4 Claims



1. An improved safety platform adapted to be used with a generally vertically disposed ladder having side rails and a plurality of rungs, including a first rung and a second rung positioned immediately above the first rung comprising:

a base member having a forward edge and a rearward edge and having a width substantially equal to the distance between the side rails of the ladder;

a back member having a lower edge and an upper edge and having a width substantially equal to the distance between the side rails of the ladder, with the lower edge of the back member being connected with the rearward edge of base member;

first means for supporting the base member on the first rung of the ladder so that the base member is positioned in a generally horizontal plane and to the rear of a plane defined by the rungs and side rails of the ladder and for preventing generally horizontal relative movement between the forward edge of the base member and the first rung of the ladder, the first means including a first portion integral with and depending from the forward edge of the base member, a second member depending from the undersurface of the base member at a position spaced to the rear of the first portion, means for permitting the position of the second member to be adjusted, vis-a-vis the first member, so that rungs of varying demensions may be positioned between the first portion and the first member, and means for selectively securing the second member to the base member so that when secured, the second member cannot be moved relative to the first portion;

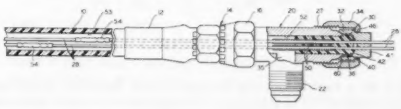
second means, adjacent to the upper edge of the back member, for supporting the back member on the second rung of the ladder so that the back member is positioned in a generally vertical plane and for preventing generally horizontal relative movement between the upper edge of the back member and the second rung of the ladder, the second means including a second, curved portion integral with and extending to the rear from the upper edge of the back member, with the distal end of the second portion being straightened so as to lie in a plane substantially parallel to and to the rear of the plane of the back member, with the radius of curvature of the second portion being greater than one-half of the maximum cross-sectional dimension of the second rung and with the second portion being adapted to fit about the second rung so that the second rung is disposed between the rearward surface of the back member and the distal end of the second portion; and

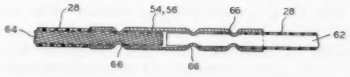
means for selectively and releasably latching the upper edge of the back member to the upper rung so as to prevent generally vertical relative movement between the upper edge of the back member and the second rung of the ladder, the latch means including a curved latching arm having a first end pivotally mounted on the radially outwardly facing surface of the second, curved portion and having a second end which is movable between a latched position wherein the second end abuts the rearward surface of the back member at a point spaced below the second rung and an unlatched position wherein the second end is positioned adjacent to the distal end of the second portion, the second end of the latching arm being biased by gravity to its latched position.

3,899,046
COUPLING ELECTRIC LINE INSIDE OF FLUID CONDUIT

Howard C. Hansen, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed July 3, 1974, Ser. No. 485,394
Int. Cl.[2] B66F 9/20; B66B 9/20; F16L 11/12
U.S. Cl. 187—9 E 20 Claims





1. An electric line and fluid conduit assembly comprising, in combination, a fluid conduit containing a pressure fluid, a fitting forming a portion of the conduit, and electric line means extending through an element of the fitting from a location outside the conduit to the interior thereof, means securing the electric line means in said fitting element and preventing leakage of fluid from said conduit through said fitting element, said electric line means including a conductor and insulation around the conductor, and means permitting the fluid in the conduit to flow into the interior of the insulation into contact with the conductor.

16. In an upright assembly for lift trucks and the like having a plurality of telescopically related mast sections, a load carriage means mounted for elevation on one of the mast sections and pressure fluid operated hoist motor means mounted in the upright assembly and operatively connected to the mast sections and carriage means for elevating the latter, flexible fluid pressure conduit means reeved in the upright assembly for connecting the carriage means with a source of fluid pressure during elevation thereof, flexible electric line means for connecting the carriage means with a source of electricity during elevation thereof and being reeved inside of the fluid conduit means for flexure therewith during operation of the upright assembly, said electric line means including a conductor and insulation around the conductor, and means permitting the fluid in the conduit to flow into the interior of the insulation into contact with the conductor to tend to equalize the fluid pressure interior and exterior of the electric line means.

3,899,047
IMPACT ABSORBING DEVICE AND MOTOR VEHICLE BODY STRUCTURE INCORPORATING THE SAME

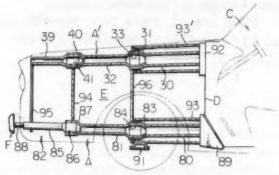
Teruo Maeda; Hideo Shimoe; Yasuhiko Fujiwara, all of Yokohama; Norimoto Aya, Tokyo; Nagayuki Marumo, Yokohama; Heigo Tsuji, Fujisawa, and Yuzo Sakamoto, Yokosuka, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Apr. 18, 1973, Ser. No. 352,229

Claims priority, application Japan, Apr. 19, 1972, 47-39394; Apr. 19, 1972, 47-39396; Apr. 19, 1972, 47-39397; Apr. 19, 1972, 47-39398; Apr. 22, 1972, 47-40712; Apr. 22, 1972, 47-47916; Aug. 29, 1972, 47-100825

Int. Cl. B60r *19/02*

U.S. Cl. 188—1 C **13 Claims**



12. In a motor vehicle having a rigid member stationarily fixed relative to a passenger compartment when there is a collision of the motor vehicle: a plurality of elongated hollow members connected at one end with said rigid member and extending in fore-and-aft direction therefrom; a corresponding number of first elongated deformable tubular members positioned within said fixed elongated hollow members respectively, said first elongated deformable tubular members connected at one end thereof with said rigid member and having free ends; a corresponding number of second elongated deformable tubular members; a corresponding number first means for deforming said first elongated deformable tubular means upon motion of said second elongated deformable tubular members relative to said first elongated deformable tubular members, said second elongated deformable tubular members being telescopically connected with said first elongated tubular members by said first deforming means respectively; a first cross panel interconnecting said fixed elongated hollow members and said free ends; a corresponding number of third elongated members; a corresponding number of second means for deforming said second deformable tubular members upon motion of said third elongated members relative to said second elongated deformable tubular members, said third elongated members being telescopically connected with said second elongated tubular members by said second deforming means respectively; and a second cross panel interconnecting said second elongated deformable tubular members.

3,899,048
SELECTIVE BRAKING ASSEMBLY

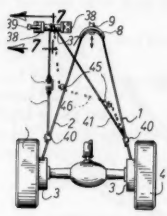
Marius E. Huvers, 480 Carre du Gue, Sainte Therese, Quebec, Canada

Filed Sept. 17, 1973, Ser. No. 398,005

Int. Cl.[2] B60T *1/00*

U.S. Cl. 188—16 **7 Claims**

1. A vehicle comprising a floor, a differential gear drive, a pair of traction wheels drivingly connected to said differential gear drive on opposite sides thereof, a pair of braking mechanisms connected to said pair of traction wheels respectively, a common braking assembly, a selective braking assembly separately addable to said common braking assembly, the latter including a pair of brake actuating links connected to said pair of braking mechanisms respectively, and a common actuation mechanism operatively connected to said pair of brake actuating links and constructed and arranged to produce simultaneous actuation of the latter and of said braking mechanisms, said selective braking assembly being entirely secured under said floor and including a reciprocatively rotatable member, a hand lever, and a pair of differential braking links extending entirely under said floor and operatively connected to said brake actuating links respectively and to said reciprocatively rotatable member for opposite reciprocating



movement and differentially actuating said brake actuating links in response to rotation of said reciprocatively rotatable member, the latter being secured under said floor and having an axis of rotation projecting transversely of the vehicle, and said hand lever projecting upright through said floor, engaging said operatively rotatable member, and producing fore and aft pivotal reciprocation of the latter about said axis of rotation thereof.

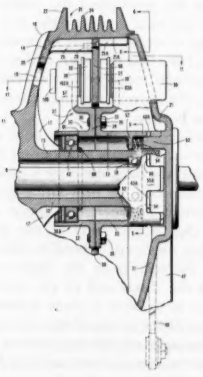
3,899,049
COMBINATION BRAKE AND VEHICLE ASSEMBLY

Thomas C. Martin, 185 Devonshire St., Boston, Mass. 02110

Continuation of Ser. No. 233,962, March 13, 1972, abandoned, which is a continuation-in-part of Ser. Nos. 61,258, Aug. 5, 1970, and Ser. No. 849,312, Aug. 12, 1969, abandoned. This application Nov. 27, 1973, Ser. No. 419,336

Int. Cl. B60t *1/06*

U.S. Cl. 188—18 A **14 Claims**



1. A combination brake and vehicle assembly including a fork with legs interconnected at the free end by an axle comprising:

a wheel including a hub having a center core defining an aperture receiving the axle and positioning the hub intermediate the legs of the fork;

means intermediate said core and axle for rotatably supporting said hub relative to aid axle;

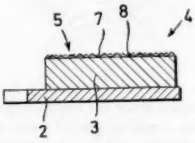
said hub including tire support means;
an annular disc having bearing surfaces on opposite sides of said disc;
means securing said disc to said hub for rotation therewith;
a pair of brake shoes each having brake pads with each of said pads aligned with one of said bearing surfaces;
calipers for holding each of said brake shoes arranged one on each side of said disc;
caliper support means for commonly supporting said calipers extending at least partially over and coaxial with said core;
bearing means disposed intermediate the overlapping portions of said core and caliper support means for supporting and permitting relative rotational movement of said core and caliper support means; and
means maintaining said caliper support means in fixed rotational relation to said axle.

3,899,050

LINING FOR BRAKE SHOES

Wolf Savary, Leverkusen, and Hartmut Soennecken, Halver, both of Germany, assignors to Textar GmbH, Leverkusen-Schlebusch, Germany

Continuation-in-part of Ser. No. 267,725, June 29, 1972, abandoned. This application Feb. 22, 1974, Ser. No. 445,030
Claims priority, application Germany, July 6, 1971, 2133455; Dec. 14, 1973, 2362190
Int. Cl.[2] F16D *69/02*
U.S. Cl. 188—73.1 **12 Claims**



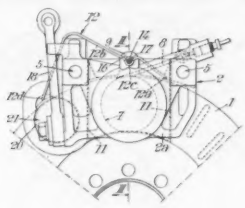
1. A lining for brake shoes comprising
a. a base layer comprising a filler and a binder for said filler for frictionally engaging an opposing relatively moving surface to brake said movement, and
b. a coating on a surface of said base layer, said coating comprising a particulate abrasive material and a binder for said particulate abrasive material for initial grinding of said opposing relatively moving surface,
c. said coating having a non-uniform thickness and the surface of said coating, for contacting said opposing relatively moving surface having an undulating configuration with rib-like projections when viewed in cross section, said rib-like projections being substantially parallel and discontinuous, each of said rib-like projections including a plurality of unequally spaced interruptions of varying length separated by unequally spaced humps, the humps of said plurality of rib-like projections being arranged such that there is at least one hump along any imaginary line extending in a direction transverse to said parallel rib-like projections, to permit abrasive particles loosened from said coating to be discharged, preventing said loosened particles from scratching said relatively moving surface.

3,899,051

DISC BRAKES ESPECIALLY FOR AUTOMOBILES

Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Continuation of Ser. No. 263,689, June 16, 1972, abandoned. This application Apr. 22, 1974, Ser. No. 462,923
Claims priority, application France, June 17, 1971, 71.22043
Int. Cl. F16d *55/228*
U.S. Cl. 188—73.5 **1 Claim**



1. Disc brake, comprising:
a disc fast to a brake shaft,
a fixed brake frame arranged straddling a portion only of the periphery of the disc,
two friction element supports held one at each side of the disc on said frame by means of rigid and removable fixing means comprising at least one spindle whose axis is in a plane parallel to the disc shaft and engaged through at least one hole in the frame so that these two supports can slide on guide surfaces of this frame in a direction substantially parallel to said shaft, said spindle having two recess grooves therein,
control means adapted to displace, with respect to the frame, each movable friction element support in the direction which tends to grip the disc between the two friction elements,
an auxiliary brake having friction element supports cooperating with said disc, and
an antivibration spring steel elastic wire having a branch passing through the plane of the disc and supported on the friction element supports and two lateral branches arranged approximately in two planes practically equidistant from the plane of the disc with the respective ends of said lateral branches in contact with the friction element supports of said auxiliary brake, said two lateral branches each possessing an intermediate portion, each adapted to be elastically engaged in one of the recess grooves of said spindle, whereby said friction elements are prevented from vibrating and ensuring the support of the lateral branches of said spring while immobilizing said spindle with respect to the frame in an axial direction.

3,899,052

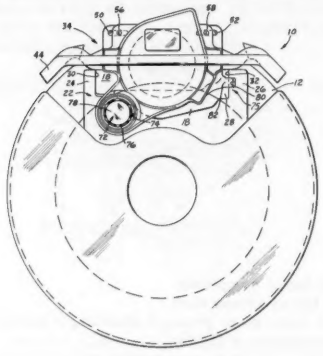
DISC BRAKE

Richard T. Burnett, and James J. Colpaert, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed May 20, 1974, Ser. No. 471,265
Int. Cl. F16d *65/20*
U.S. Cl. 188—73.6 **5 Claims**

1. In a disc brake, a rotor having a pair of friction faces, a pair of friction elements, one of said elements being disposed adjacent each of said friction faces, a member straddling said rotor and engaging each of said friction elements for urging each of the latter into braking engagement with their corresponding friction faces when a brake application is effected, a fixed support member, means slidably mounting said straddling member on the support member for transverse relative movement with respect to the rotor, said straddling member

having an opening exposing the edge of each of said friction elements whereby the latter may be removed from the straddling member in a direction radially outwardly with respect to the rotor, releasable means engaging each of said friction elements to retain them on the straddling member, said support member defining a recess, one of said friction elements being received within said recess, and a lost motion connection between said one friction element and said releasable means so that relative movement is permitted between the one



friction element and the straddling member without release of the releasable means;

said slidably mounting means including a groove in one of said members and a tongue projecting from the other member and received in said groove;

said releasable means including first pin means, said lost motion connection including an elongated opening in said one friction element receiving said pin means, the width of said opening being wider than the length of said tongue received within said groove.

3,899,053

AUTOMATIC BRAKE-WEAR RESETTING DEVICE

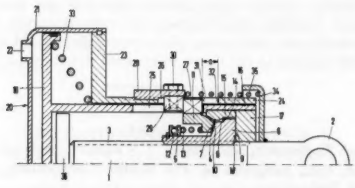
Gyula Nadas, Eching, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed Apr. 4, 1974, Ser. No. 457,966

Claims priority, application Germany, Apr. 4, 1973, 2316822

Int. Cl.[2] F16D *65/66*

U.S. Cl. 188—203 **8 Claims**



1. In an automatic resetting device for brakes particularly for railway vehicles, the combination of a non-rotatable first sleeve axially displaceable in the braking direction in response to a braking force, a non-rotatable threaded shaft coaxially disposed within said first sleeve and axially displaceable in the braking direction, a coupling nut threaded upon said shaft and capable of rotary and axial movement thereon, a non-rotatable control sleeve resiliently urged in the braking direction against said coupling nut and capable of limited axial displacement, the contacting surfaces of said nut and control sleeve defining a first rotary coupling, said nut having a second surface engageable with a first surface on said first sleeve upon relative axial displacement between said first sleeve and said nut to define a second rotary coupling, said nut having a third surface contacting a second surface on said first sleeve to define a stop limiting the opening of said second rotary coupling, and spring means acting upon said first sleeve in a direction opposite the direction of braking to return the first sleeve to its release position upon removal of the braking force.

3,899,054

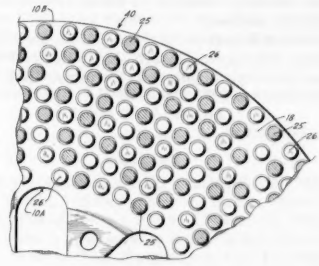
DISC BRAKES WITH COOLING RODS

Howard B. Huntress, Suffern, N.Y., and Raymond J. Novotny, Sparta, N.J., assignors to Abex Corporation, New York, N.Y.

Filed Feb. 8, 1974, Ser. No. 440,854

Int. Cl. F16d *65/10*

U.S. Cl. 188—218 XL **3 Claims**



1. In a cast disc brake rotor for dissipating heat incidental to braking comprising a pair of spaced walls, each presenting an exterior braking surface and an opposite interior surface, and a plurality of connecting rods rigidly connecting said interior surfaces and maintaining the fixed positional relationship therebetween, the improvement comprising:

a plurality of separated truncated rods cast integral with the rotor and protruding from each of the interior surfaces, said connecting rods and truncated rods being interspersed generally uniformly between the inner circumference and outer circumference of said interior surfaces and staggered relative to one another to constrain fluid passing outwardly between said walls to follow a tortuous path.

3,899,055

BRAKE ACTUATING MECHANISM

Russell L. Shreve, 915 W. Wattles Rd., Troy, Mich. 48084

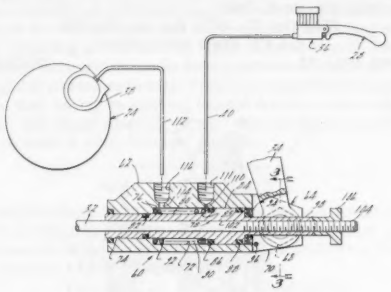
Filed Feb. 8, 1974, Ser. No. 440,673

Int. Cl. B62l *3/04*; **B60t** *11/02*

U.S. Cl. 188—344 **4 Claims**

1. A braking system for a two wheeled vehicle including a caliper associated with a front disc brake and operable in response to pressurizing a hydraulic fluid, a lever arm associated with a rear mechanical brake and operable in response to selective displacement of a linkage and a reservoir providing a source of pressurized fluid media, the improvement comprising a mechanism for actuating said front brake subsequent to said rear brake, said mechanism including a housing defining a fluid cylinder having first and second ports and an end portion pivotably connected to said lever arm, first means for communicating said reservoir with one of said first and second

ports, second means for communicating said caliper with the other of said ports, and third means located in said cylinder for initially blocking said first port and subsequently pressurizing said caliper in response to displacing said linkage.

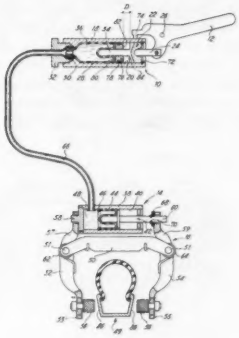


3,899,056
HYDRAULIC BICYCLE BRAKE ASSEMBLY
Carl L. Doerr, 2850 Ladoga, Long Beach, Calif. 90815
Filed Apr. 30, 1973, Ser. No. 355,555
Int. Cl. B60t 11/16
U.S. Cl. 188—344 **3 Claims**

1. In combination with a bicycle having a handle bar and a brake assembly of the type in which a pair of pivotally connected arms having first and second ends are transversely positioned relative to a wheel of said bicycle, said arms supporting a pair of brake pads on said first ends thereof that are brought into frictional pressure contact with a rotating portion of said wheel when said arms are pivoted from a first to a second position; hydraulically operated, spring loaded means that are operatively associated with said second ends of said arms to move the latter from said first towards said second position when a quantity of hydraulic fluid in said spring loaded means has additional hydraulic fluid added thereto; a tube that is at all times in communication with said hydraulic fluid in said spring loaded means, with said brake assembly being characterized by including:

a. at least one resilient pressure-deformable elongate hollow body formed from an elastomeric material that defines a confined space in communication with said tube, said body longitudinally and adjacently disposed relative to said handle bar, and said tube and confined space filled with hydraulic fluid, and said body having a longitudinal cavity therein that slidably engages an end portion of said handle bar to support said hollow body thereon, with said body serving the dual function of acting as a grip to be grasped by a hand of a user in guiding said bicycle with said handle bar and as a means for discharging additional hydraulic fluid under pressure to said spring loaded means when the confined space in said hollow body is decreased by said user transversely deforming said hollow body by gripping the same with increased pressure by said hand in contact therewith.

3,899,057
HYDRAULIC CONTROL CIRCUIT
Jean-Jacques Carre, Montreuil, France, assignor to Societe Anonyme D.B.A., Paris, France
Continuation of Ser. No. 324,688, Jan. 18, 1973, abandoned. This application Feb. 22, 1974, Ser. No. 444,629
Claims priority, application France, Jan. 25, 1972, 72.02303
Int. Cl.² B60T 11/16
U.S. Cl. 188—351 **2 Claims**

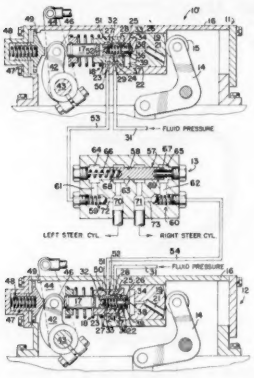


1. A hydraulic control circuit comprising at least one pressure generating assembly of the piston and cylinder type whose pressure chamber is connected to the pressure chamber of at least one pressure receiving assembly of the piston and cylinder type to define a sealed compartment; at least one compensating assembly of the piston and cylinder type whose compensating chamber is connected to the sealed compartment to define a fluid-tight enclosure filled with a predetermined quantity of incompressible fluid, said compensating assembly comprising a compensating piston capable of being displaced towards the interior of the compensating chamber to reduce the volume thereof when the forward stroke of one of the pistons in the generating and receiving assemblies exceeds a predetermined value, the compensating piston cooperating by way of anti-return means with the cylinder of the compensating assembly so as to remain stationary relative to the latter cylinder during the return stroke of the said one of the pistons in the generating and receiving assemblies, said compensating assembly being situated in one of the generating or receiving assemblies, the compensating piston being coaxial with said one of the pistons in the generating and receiving assemblies and cooperating with the latter by way of a one-way thrust coupling with lost motion, said generating assembly comprising a casing, an assembly of concentric pistons mounted in the bore of said casing in a fluid-tight manner, said assembly of concentric pistons comprising an annular compensating piston defining a central orifice slidably mounting an actuator piston connected to an intake controlling member, said intake controlling member belonging to the generating assembly and having a shoulder capable of abutting on the annular piston when the stroke of the actuator piston towards the interior of the pressure chamber of the generating assembly exceeds a predetermined value.

3,899,058
COMBINED TRACTOR STEERING CLUTCH AND BRAKE CONTROL SYSTEM

Daniel Pasquini, Bartonville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 1, 1974, Ser. No. 438,596
Int. Cl.[2] F16D 67/04
U.S. Cl. 192—13 R 9 Claims

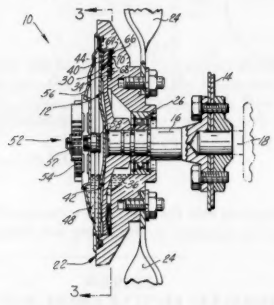


1. In a track-type vehicle having first and second clutch and brake controlled tracks, a combined control system for sequential control of the steering clutch and brake functions of said tracks, said control system including, a source of fluid under pressure, first and second booster valve means for respectively controlling the clutch and brake means of said first and second track, first fluid communication means between said source and said first booster valve means, second fluid communication means between said source and said second booster valve means, flow control valve means for controlling the flow of fluid under pressure from said first and second booster valve means to respectively said clutches for said first and second tracks, third and fourth fluid communication means respectively between said first booster valve means and said flow control valve means and between said second booster valve means and said flow control valve means, first and second actuation means for respectively mechanically actuating said first and second booster valve means for controlling the flow of fluid through said third and fourth fluid ccommunication means and for selectively causing the engagement of said first and second brakes of said tracks, said flow control valve means including first and second inlet ports connected respectively to said third and fourth fluid communication means, said control valve means further including first and second outlet ports connected by means of fifth and sixth fluid communication means to said respective clutches of said first and second tracks for selective engagement and disengagement of said clutches said flow control valve means including means for blocking fluid flow from said third and fourth communication means to said fifth and sixth communication means when fluid pressure in said third communication means is substantially the same as that in said fourth communication means.

3,899,059
FLUID COUPLING ASSEMBLY

Wayne K. Leichliter, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 23, 1973, Ser. No. 408,888
Int. Cl.[2] F16D 35/00, 67/00
U.S. Cl. 192—57 24 Claims

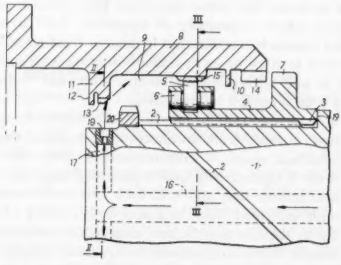


1. A fluid coupling comprising an input coupling member capable of being rotated at relatively high and low speeds, a rotatable output coupling member disposed adjacent to said input coupling member, means for supporting said coupling members for relative rotation, said input and output coupling members having spaced apart opposed surface portions defining a fluid shear space therebetween and cooperating with a fluid shear medium during relative rotation between said coupling members to provide a fluid drive between said coupling members, and resiliently deflectable spring means spaced from said shear space for preventing relative rotation between said coupling members during low speed rotation of said input coupling member and for assisting said fluid drive in transmitting forces from said input coupling member to said output coupling member during relative rotation between said coupling members.

3,899,060
PAWL AND RATCHET MECHANISM

Herbert Arthur Clements, Weybridge, England, assignor to S.S.S. Patents Limited, London, England

Filed Feb. 4, 1974, Ser. No. 439,163
Claims priority, application United Kingdom, Feb. 5, 1973, 5615/73
Int. Cl.[2] F16D 23/02
U.S. Cl. 192—67 A 3 Claims



1. In a rotary pawl and ratchet mechanism comprising first and second rotary elements, means mounting said elements for rotation about a common axis, a ring of ratchet teeth carried by said first rotary element and at least one pawl carried by said second rotary element, one of said elements

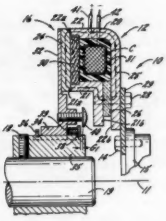
being formed to provide an annular rotary liquid-receiving chamber in which there can form a pawl-damping rotating ring of liquid having a free surface that faces towards the said axis, and at least one liquid supply duct for supplying damping liquid to said chamber, the improvement comprising means for imparting pre-rotation to liquid supplied to said chamber via said duct, said means including surfaces rotatable with said chamber and located nearer to said axis than said free surface, said duct having an opening located relative to said surfaces such that liquid supplied via said duct impinges on said surfaces prior to entry into said chamber.

3,899,061

EXCITATION CONTROL FOR NORMALLY ENGAGED, ELECTRICALLY RELEASED MAGNETIC COUPLING

William H. Krug, Janesville, Wis., assignor to Warner Electric Brake & Clutch Company, Beloit, Wis.

Filed Apr. 29, 1974, Ser. No. 464,741
Int. Cl. F16d *27/01*
U.S. Cl. 192—84 PM **6 Claims**



1. In combination with
a. a magnetic coupling having
two relatively movable parts forming a magnetic flux path and attracted into physical coupling with one another when magnetic flux of a predetermined density is established in said path,
a permanent magnet included in said path and presenting a first mmf normally establishing at least said predetermined flux density,
a coil electromagnetically associated with said path to produce a second mmf which opposes the first, the second mmf being generally proportional to excitation current through the coil and acting, when sufficiently great, to reduce the flux density in said path enough to physically decouple said parts,
the improvement of an excitation control having input terminals adapted for connection to an unregulated dc. voltage source and output terminals connected to said coil, and wherein said control comprises
1. control means interposed between said input and output terminals and responsive to a control signal for varying the magnitude of current transmitted through said coil,
2. means for sensing the voltage across said coil,
3. means for sensing the current through said coil, and
4. means responsive to said means (2) and (3) for applying to said control means a control signal which varies according to changes in the weighted sum of the voltage across and the current through said coil.

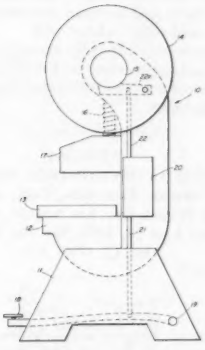
3,899,062

FAIL-SAFE DISENGAGEMENT MECHANISM

Raymond L. Ward, 2 Monadnock Rd., Worcester, Mass. 01609

Filed Oct. 31, 1974, Ser. No. 519,431
Int. Cl.[2] F16P *7/00;* **F16D** *9/00*
U.S. Cl. 192—129 R **4 Claims**

1. A safety device for a mechanical tool of the punchpress type having machine operating means, actuating means adapted to initiate operation of the machine operating means for a cycle of operation, and a safety means connecting said actuating means and said operating means adapted to transmit an actuating signal mechanically from said actuating means to said operating means for a single cycle of operation and to interrupt said operating means after completion of one and only one cycle of machine operation, said safety means comprising:
a pivotally mounted drive member connected and mounted to rotate between a first rest position and a second actuated position
means connecting said actuating means to drive said member to rotate said drive member to said actuated position in response to an actuating signal;
a pivotally mounted driven member rotatable between a rest position and an actuated position;
a force loaded cam follower positioned and adapted to bear against both of said drive member and said driven member in said rest positions and to drive said driven member rotationally when said drive member is rotated;
a cam path member positioned adjacent to said cam follower and positioned to receive said cam follower when the drive member and driven member are moved from said rest positions toward said actuated positions, said



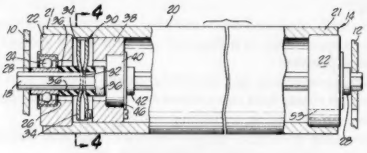
cam path member being disposed to disengage said force loaded cam follower from said driven member in its actuated position;
a cam surface on said drive member shaped to receive and hold said cam follower in a rest position disengaged from said cam path member and shaped to form a cam path out of engagement with said driven member when said drive member is in the actuated position;
a cam surface on said driven member shaped to receive said cam follower in said rest position;
force loading means connected with the driven member to force said driven member to its rest position when said actuating means is released;
and means mechanically connected to said driven member to transmit mechanical motion to said machine operating means to cause engagement of said machine operating means when said cam follower bears on and rotates said driven member;
whereby actuation of said actuating means releases said cam follower from said drive member to drive said driven member and to operate said machine, and whereby the cam surface of said driving plate holds said cam follower out of engagement with the driven member during machine operation and until said drive member is returned to its rest position.

3,899,063

ROLLER MECHANISM FOR CONVEYING SYSTEMS

Orray R. Pollard, 31297 Granado, Palos Verdes, Calif. 92274

Filed Apr. 8, 1974, Ser. No. 459,055
Int. Cl. B65g 13/00
U.S. Cl. 193—35 A 10 Claims



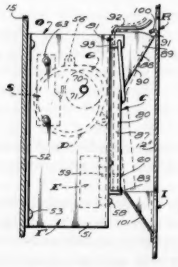
1. A roller braking mechanism comprising:
a roller;
an axle defining a first axis, said roller being rotatably mounted on said axle to rotate about said first axis;
a hammer;
hammer mounting means for mounting said hammer on said axle to prevent rotation of said hammer about said first axis;
anvil means mounted on said roller and fixed to rotate with said roller, said anvil means extending to at least one position where said hammer and said anvil means will engage as said roller rotates; and
resilient constraining means for resisting relative movement between said hammer and said anvil means in a direction along said first axis tending to disengage said anvil means and said hammer.

3,899,064

TIMED COIN CONTROL DEVICE

Ernest Newell Martin, Escondido, Calif., assignor to Arrowhead Puritas Waters, Inc., Los Angeles, Calif.

Filed June 28, 1974, Ser. No. 484,242
Int. Cl. G07f 5/10
U.S. Cl. 194—9 T 10 Claims



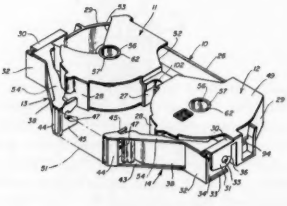
1. A coin actuated control means for vending machines including coin handling means comprising a front wall with a coin receiving slot and a coin return opening spaced below the slot and accessible at the front of the wall, an elongate vertical coin conducting chute rearward of the wall with a coin inlet opening at its top communicating with the slot and a coin outlet opening at its bottom normally spaced rearward and above the return opening, hinge means pivotally supporting the upper end portion of the chute on an axis in fixed spaced relationship rearward of the wall, a coin receptacle below the chute, mechanical drive means rearward of and engageable with the chute to move the lower end of the chute forwardly from a normal position to an actuated position where the outlet opening occurs above and communicates with the return opening and thence to its normal position, an electric powered prime mover for the drive means, a power supply, a normally open switch means connected with and between the prime mover and power supply and including an operating element engageable by a coin in the lower portion of the chute when the chute is in its normal position to close the switch means, energize the prime mover and initiate operation of the drive means, a rotary cam means driven by the drive means and engaging the switch means to maintain the switch means closed through a predetermined extent of one revolution of the cam means and control means for a related vending machine and operable in response to closing of said switch means.

3,899,065

RIBBON CASSETTES FOR SINGLE ELEMENT TYPEWRITERS

Frederick A. Brignole, Granby, Conn., assignor to Litton Business Systems, Inc., New York, N.Y.

Filed July 22, 1974, Ser. No. 490,860
Int. Cl.[2] B41J 33/14
U.S. Cl. 197—151 4 Claims



1. A ribbon cassette comprising
a container having upper and lower walls, and discontinuous side walls forming ribbon openings,
wound ribbon spools,
means in said upper and lower walls for rotatably supporting said ribbon spools in spaced apart relationship,
vibrator arms,
means pivotally securing said vibrator arms to said side walls,
said vibrator arms extending outwardly from said pivotal securing means and toward one another defining a ribbon gap between said vibrator arms,
ribbon extending from one spool to the other spool and across the gap between said vibrator arms, and
means on the vibrator arms for coupling said vibrator arms to ribbon elevating means.

3,899,066

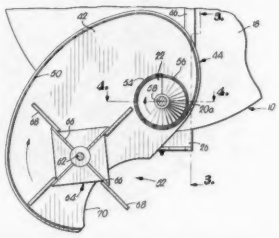
LIQUID MANURE LOADING APPARATUS

Thomas A. Bedwell, Providence, and Bruce L. Call, Logan, both of Utah, assignors to Hesston Corporation, Heston, Kans.

Filed Dec. 12, 1973, Ser. No. 426,632
Int. Cl. B65b 65/02
U.S. Cl. 198—7 R 24 Claims

1. In an implement having a holding tank for liquid manure obtained from a pool thereof, loading apparatus associated with said tank including:
a pickup housing mounted on said tank exteriorly thereof and adapted for insertion into said pool,
said housing having an intake for manure from the pool and said tank having means defining an inlet for picked-up manure from the housing;
a conveyor disposed adjacent said inlet and leading into the tank for delivering manure from the housing into the tank during operation of the conveyor; and
an agitator-loader device on said housing adjacent said intake for aggressively churning the pool to thoroughly

admix all levels thereof and for concurrently drawing the agitated manure through the housing toward said



inlet and the conveyor when the device is actuated, said housing being retractable from a lowered, loading position to a raised, transport position.

3,899,067

HANDRAILS FOR CONVEYORS

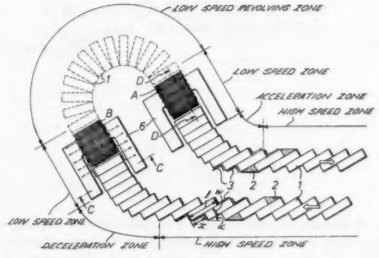
Kyozo Kondo, Mihara, and Takeyoshi Okimoto, Takehara, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1974, Ser. No. 453,158

Claims priority, application Japan, Mar. 23, 1973, 48-32722

Int. Cl. B66b *9/12*

U.S. Cl. 198—16 MS **6 Claims**



1. A variable speed conveyor which comprises a plurality of movable elongate platforms whose relative displacement varies as the conveyor advances and a handrail mounted at each end of each platform, each handrail comprising a lateral portion which, when the relative displacement of the platforms is zero, extends in the direction of advance of the conveyor, and a longitudinal portion at an angle to the lateral portion, the arrangement of the handrails being such that when the relative displacement of the platforms is zero the lateral portions of adjacent handrails cooperate to form safety barriers extending along the conveyor and when the relative displacement of the platforms is greater than zero the lateral and longitudinal portions of adjacent handrails cooperate to form safety barriers extending along the conveyor.

3,899,068

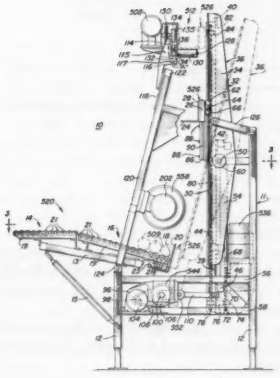
FEEDING APPARATUS

Gary Leonard Wallace, Oak Lawn; John J. Linehan, Arlington Heights, and Robert Howard Marshall, Hinsdale, all of Ill., assignors to Chemetron Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 293,145, Sept. 28, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,262

Int. Cl. B65g *47/00*

U.S. Cl. 198—27 **12 Claims**



1. Apparatus for handling elongated masses of material, each mass having a longitudinal axis, said apparatus comprising queuing table means for holding a plurality of masses side by side with their longitudinal axes parallel, said table means having a discharge side parallel to the longitudinal axis of a mass supported in a discharge position adjacent said discharge side, means adjacent said discharge side for elevating said masses sequentially from said discharge position to an elevated position said elevating means comprising an elongated carriage mounted for pivotal movement about a horizontally disposed axis and pivotal between a first upright position and a second inclined position, means for pivoting said structure between said positions, elevator means mounted on said carriage for reciprocal movement along said carriage upwardly toward an upper discharge position and downwardly toward a lower receiving position, means for driving said elevator upwardly and downwardly along said carriage, said elevator means including means for lifting an elongated mass positioned on the discharge side of said table means as said elevator is driven upwardly from said lower receiving position with said carriage in said second inclined position and to discharge said lifted mass onto said conveying means as said elevator means is driven downwardly along said carriage with said carriage in said first upright position after said carriage has been pivoted to said first upright position with said elevator means in said upper discharge position, and conveyor means for receiving the masses from said elevating means adjacent said elevated position and conveying said masses in end-to-end relation in a direction parallel of the longitudinal axes of the masses.

3,899,069

ROTARY TRANSFER APPARATUS FOR GROUPING ARTICLES

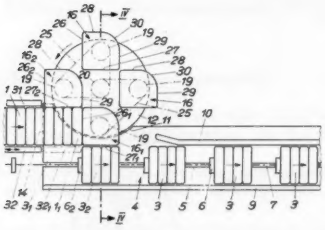
Hans Heinzer, Beringen, Switzerland, assignor to Sig Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed July 18, 1974, Ser. No. 489,719

Claims priority, application Switzerland, July 18, 1973, 10494/73

Int. Cl.[2] B65G *47/00*

U.S. Cl. 198—25 **10 Claims**



1. An apparatus for grouping articles, the apparatus including an inlet conveyor for carrying non-grouped articles, the inlet conveyor having a feed direction and a discharge end; and an outlet conveyor for carrying the grouped articles, comprising in combination:

a. a plurality of spacedly supported collector pushers each having a pushing edge and a retaining edge normal to said pushing edge;

b. means for successively bringing said collector pushers into a work position at the beginning of a work stroke in alignment with the feed direction of said inlet conveyor at the discharge end thereof;

c. means for moving each collector pusher with an increasing speed in the feed direction during the work stroke of the collector pusher for forming a first group of articles of predetermined number backed up behind said retaining edge; and

d. means for moving each collector pusher, during its work stroke, in a direction transverse to the feed direction for displacing, with said pushing edge, a second, previously formed group of articles onto a conveying path of said outlet conveyor.

3,899,070

TRACTION-DEMAND POWER DRIVE UNIT

John M. Lang, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 27, 1973, Ser. No. 374,196

Int. Cl.[2] B65G *13/02*

U.S. Cl. 198—127 R **7 Claims**

1. A powered drive roller mechanism for moving a cargo container or the like comprising:

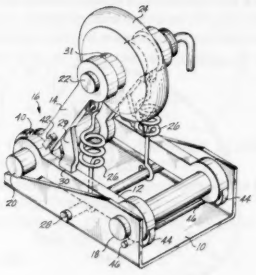
a base;

a linkage means including a lower link pivotally attached to said base, and an upper link pivotally attached to said lower link;

a powered roller mounted for rotation on said upper link, said roller having a first position for engagement with a lightly loaded container;

biasing means for urging said roller away from said container and for holding said roller in said first position;

wherein said linkage means is responsive to a predetermined traction force between said roller and said container to overcome said biasing means and pivot with respect to said base to move said roller in a direction opposite to the direction of movement of said container



and into position of more forceful load engagement with said container.

3,899,071

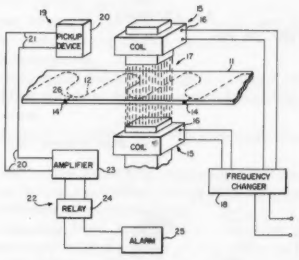
CONVEYOR BELT PROTECTIVE SYSTEM

Walter Roy Duffy, 1914 Howard St., Butte, Mont. 59701

Filed June 29, 1973, Ser. No. 374,944

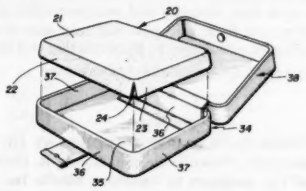
Int. Cl. B65g *43/02*

U.S. Cl. 198—232 **1 Claim**



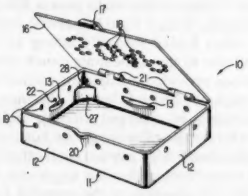
1. A system for monitoring the condition of conveyor belts comprising a conveyor belt adapted to be supported by a pair of spaced roller means and driven in endless path, an elongated conductor in said belt, said conductor disposed in said belt in substantially a sinusoidal pattern laterally of and extending along the length of the belt to form a closed current path, a pair of megnetically coupled coils positioned adjacent said conveyor belt for providing a magnetic field through which said conveyor belt passes to induce an electric current in said closed current path, detecting means disposed adjacent said conveyor belt, said detecting means responsive to the condition of said conveyor belt and capable of producing an output when said condition changes, circuit means including amplifier means for amplifying an output from said detecting means, relay means and an alarm, said circuit means connected to said detecting means for signalling the occurrence of said output, and a plurality of taps disposed in the edge of said conveyor belt, each said tap including a conductor in electrical contact with said elongated conductor to monitor continuity along said electrical path.

3,899,072
NEST FOR A CADDY
Douglass M. Reinhart, Lititz, Pa., assignor to Schick Incorporated, Lancaster, Pa.
Filed Aug. 6, 1973, Ser. No. 386,013
Int. Cl.[2] B65D 5/50
U.S. Cl. 206—45.19 2 Claims



1. In a package for an article including a caddy box and a nest assembly, said caddy box including a rectangular bottom wall and side walls vertically extending upwardly from the periphery of the bottom wall, the improvement being in said nest which is thermoformed of plastic and which telescopically fits within said caddy box, said nest including a rectangular article receiving panel having cavity means formed to matingly receive an article, side walls extending downwardly and slightly outwardly from the periphery of said panel, and inwardly-collapsible bellows means interconnecting between the ends of adjacent side walls of said nest assembly, each of said bellows means comprising a pair of triangular-shaped panels joined directly to each other by a common fold line and to respective ones of said adjacent side walls along fold lines extending from a respective corner of said article receiving panel for urging said side walls outwardly when forced to a vertical position in the caddy box thereby providing an intimate and frictional engagement with the caddy side walls.

3,899,073
SOAP CONTAINER
Katie H. Barr, 7121 Bull Run Post Office Rd., Centreville, Va. 22020
Filed June 13, 1974, Ser. No. 478,854
Int. Cl. A47k 5/04
U.S. Cl. 206—77.1 7 Claims

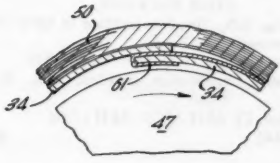


1. A container for a bar of soap, comprising: a base member and a plurality of side walls attached to said base member; a flange mounted on the inner surface of each side wall, each of said flanges being located equidistant from said base member; a removable support plate for supporting the bar of soap, said support plate being perforated with a series of holes and being of a size which allows said support plate to rest on said flanges within the interior of said container, said support plate being provided with recessed indentations in opposite sides thereof to allow access for the fingers of a person removing the support plate from the container, and wherein a series of raised studs are provided on the upper surface of said support plate to elevate the bar of soap above the holes in said support plate; a detent stud for holding down an edge of said support plate located directly above the flanges on at least two of the side walls; and a hinged lid mounted on the upper edge of one of said side walls and having means for securing said lid to the side wall opposite to that upon which said lid is mounted.

3,899,074
BRAZING WASHER CHAIN
William F. Lucas, Oak Creek, Wis., assignor to Lucas-Milhaupt, Inc., Cudahy, Wis.
Filed July 1, 1974, Ser. No. 484,548
Int. Cl.[2] B65D 73/02; F16B 39/28
U.S. Cl. 206—343 2 Claims

1. A flat brazing washer chain comprising a plurality of flat washers integrally formed from a flat stock of brazing material and joined together adjacent their peripheries, each adjacent pair of said washers having adjacent peripheral portions which, if projected, would merge together to define an overlap area, a series of pairs of opposed notches formed in said chain, one notch of each pair being formed in one side of said chain, each of said notches extending into said overlap area, each pair of opposed notches defining therebetween an interconnecting portion between adjacent washers, which interconnecting portion extends through an overlap area to define a cutting zone wherein the overlap area and interconnecting portion coincide, whereby said washers are separable by cutting said interconnecting portion within said cutting zone to thereby prevent any protrusion of a washer beyond its projected periphery.

3,899,075
ADHESIVE TAPE
Joseph J. Hall, Somerville, and Leo M. Lamb, Freehold, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.
Division of Ser. No. 174,747, Aug. 25, 1971, Pat. No. 3,770,542. This application May 16, 1973, Ser. No. 360,890
Int. Cl. B65d 85/672, 85/68
U.S. Cl. 206—411 2 Claims



1. A roll of normally tacky and pressure-sensitive adhesive tape, said tape having one of its major surfaces tacky and adhesive and being wound spirally upon itself in successive axially aligned overlapping convolutions with its adhesive surface facing inwardly toward the axis of the roll to form a hollow annular cylinder, and a liner sheet adhering to the adhesive surface of the innermost convolution of said tape in overlapping relation therewith and having a nonadhesive surface facing the hollow of said roll, said liner being long enough to effectively cover the inwardly facing adhesive surface of the said innermost convolution of said tape and being unattached to itself except through adherence to the said innermost convolution, whereby said liner is unwound with

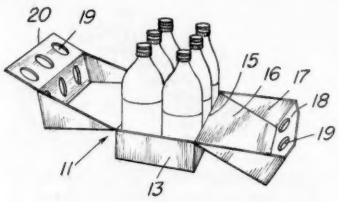
said tape as the innermost convolution of the tape is unwound from said roll.

3,899,076

BOTTLE CARRIER

John Florian, Bakersfield, Calif., assignor to Mobil Oil Corporation, New York, N.Y.

Filed July 16, 1973, Ser. No. 379,861
Int. Cl. B65d *1/22, 81/00, 85/00*
U.S. Cl. 206—427 **2 Claims**



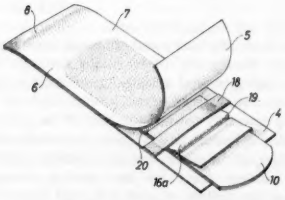
1. An integral, one-piece, thermoformed, polystyrene foam bottle carrier comprising a bottom support member, said member comprising a substantially rectangular base surrounded by four-up-standing side and end wall members integrally joined to said base, each of said side wall members having integrally hinged along their upper edges an upper side-wall member; said upper wall members having triangular shaped end panels joined, at an angle of about 90°, along their opposite longitudinal edges, said triangular end panels having their apex portions adjacent the lower hinged edge of said upper side wall members and their base portion adjacent the opposed upper edge of said upper sidewall member, the base edges of said triangular end panels and the upper edge of said side-wall member being connected by a traversely extending rectangular top retaining panel, said retaining panel having apertures therein to receive the upper neck portion of bottles positioned in said support member, whereby said bottle carrier is adapted for closure by the upward rotation of said upper side-wall members about their hinged edges whereby the apertures in said retaining panel engage the upper neck portions of bottles positioned in said carrier and said triangularly shaped end panels permit a partial view of the contents of said carrier.

3,899,077

STRIP PACKAGE

Hans Spiegelberg, Taby, Sweden, assignor to Salve S.A., Fribourg, Switzerland

Filed Feb. 26, 1973, Ser. No. 335,719
Claims priority, application Sweden, Oct. 9, 1972, 012997/72
Int. Cl. A61f *13/02;* **A61l** *15/06*
U.S. Cl. 206—441 **6 Claims**



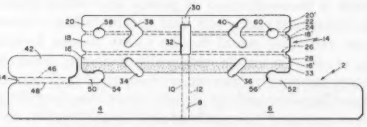
1. An individual package for a single flat adhesive bandage provided with a central pad and adhesive zones on each side thereof, said adhesive zones being covered by removable protective foils at least one of which covers said pad, said package comprising an outer casing open at one end for receiving and enveloping said flat bandage with one end of the bandage projecting therefrom, at least said one protective foil covering the pad and the adjacent adhesive zone being located within the outer casing, the end of said one protective foil nearest to the open end of said casing being folded back 180° over said pad and secured to the inner surface of said casing adjacent the open end, whereby said one protective foil may be forcibly removed from said pad and said adhesive zone when the bandage is withdrawn by its projecting end from the outer casing.

3,899,078

MERCHANDISE PACKAGING AND DISPLAY DEVICE

James P. Ambrozetes, Phoenixville, and Homer R. Diehl, Roslyn, both of Pa., assignors to American Biltrite Inc., Cambridge, Mass.

Filed Oct. 18, 1974, Ser. No. 515,902
Int. Cl.² B65D *33/14*
U.S. Cl. 206—491 **9 Claims**



1. A display hanger for automobile floor mats, comprising two complimentary elongated front and back main panels of relatively stiff material joined at one end of each by a common vertical rigid fold portion integral with each main panel; each of the main panels having extending along its upper edges plural-layered, elongated upper sub-panels of said material integral with and shorter than said main panels, each of said sub-panels being folded along a horizontal fold line defining a rigid, horizontal fold portion integral with the respective panel, a hand-hole provided in each of said sub-panels, the hand-hole in one sub-panel being aligned with the hand-hole in the other sub-panel when the main panels are folded against each other to provide a single hand-hole extending through all of said plural layers; a flap member connected to a portion of the upper edge of one of the main panels integral therewith and folded inwardly along a rigid horizontal fold portion, said flap member when folded inwardly acting to reinforce said upper edge and also to space the main panels apart; horizontal elongated notches provided in adjacent vertical edge portions of said sub-panels at one end thereof, the inner ends of said notches terminating in enlarged circular holes thereby to provide means for hanging the hanger on horizontal racks; and the main panels when folded toward each other lying adjacent to but spaced apart from each other to provide a space therebetween for the introduction of the material to be displayed on the hanger, said flap portion being within said space.

3,899,079

EASY OPENING DISPENSER FOR BARRIER CARTON OR CONTAINER

George M. Seiter, Minneapolis, Minn., assignor to Hoerner Waldorf Corporation, Saint Paul, Minn.

Filed Feb. 23, 1973, Ser. No. 334,998
Int. Cl.² B65D *5/54, 17/24, 65/28*
U.S. Cl. 206—498 **1 Claim**

1. An easy opening container containing a product, the container including:

an open topped tray having connected side and end walls,

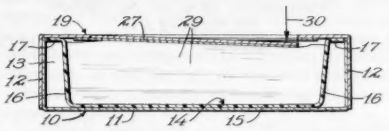
an outwardly extending continuous flange on the upper edges of said side and end walls,

a cover panel sealed about its periphery to said flange,

said cover panel having a coating of heat sealable material over its entire under surface,

a potentially removable area in said cover panel spaced inwardly from said peripherally sealed portions of said cover panel,

said removable area being defined by an endless weakened line of separation,



a patch of imperforate easily frangible metal foil secured to the under surface of said cover panel completely underlying said weakened line of separation and secured to portions of said cover panel completely encircling said weakened line,

means adhering said patch of metal foil to said cover panel on either side of said weakened line of separation,

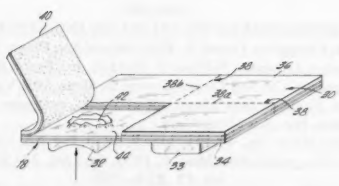
whereby downward pressure on said potentially removable area will tear said metal foil along said weakened line of separation.

3,899,080

PILL PACKAGE

Michael J. Brunda, Clifton, N.J., assignor to Standard Packaging Corporation, New york, N.Y.

Filed Feb. 8, 1973, Ser. No. 330,482
Int. Cl.[2] B65D *75/42, 75/46, 83/04*
U.S. Cl. 206—531 **5 Claims**



1. A package comprising a product container including at least one recess for housing a product and a composite lid, said lid comprising an inner rupturable layer, an outer, non-rupturable protective layer and an intermediate adhesive layer joining said protective and rupturable layers, said protective layer being removable from said composite lid without causing the rupture of said rupturable layer, said lid being heat sealed to said container to form an air-tight compartment for said product.

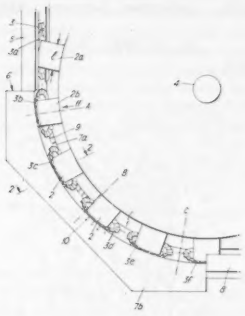
3,899,081

CLOSURE SORTING METHOD AND APPARATUS

Keith Shotbolt, Gerrards Cross; Alan Eastwood, Langley, and John Henry Gait, Ruislip, all of England, assignors to W. R. Gwace & Co., Cambridge, Mass.

Filed Feb. 5, 1974, Ser. No. 439,808
Int. Cl.[2] B07C *9/00*
U.S. Cl. 209—73 **11 Claims**

1. A method of sorting skirted closures which comprises passing skirted closures along a sorting track having a rejecting slot dimensioned so as to receive undersized closures but to block correctly sized closures, rotating each closure about its axis of symmetry as it passes along the sorting track, collecting the closures which successfully pass along the sorting



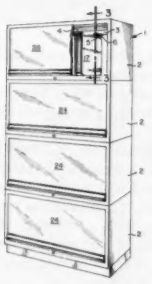
track and discarding any closures which pass through the rejecting slot.

3,899,082

BINDER STORAGE ARRANGEMENT INCLUDING REMOVABLE FLEXIBLE HANGERS

Raymond R. Young, Des Plaines, and Frank J. Malcik, Berwyn, both of Ill., assignors to Swingline, Inc., Long Island City, N.Y.

Filed Sept. 4, 1973, Ser. No. 393,999
Int. Cl.[2] H47F *7/16;* **A47B** *63/00*
U.S. Cl. 211—46 **9 Claims**



1. A binder storage support arrangement comprising

a. a storage housing;

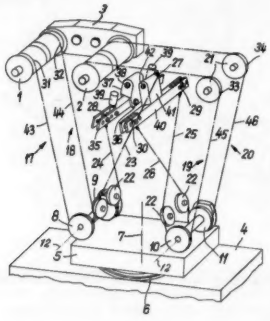
b. a frame hanger including parallel flexible elongated frame elements spaced-apart a distance such that a flanged-back binder positioned between the elements is supported by them and including hanger support end portions positioned at the ends of the elongated frame elements; and

c. a pair of oppositely spaced first and second housing frame engaging and supporting means adapted to respectively engage each of said hanger support end portions and associated with the storage housing and being shaped, configured and spaced apart to receive the hanger when flexed and to hold the hanger through said hanger support end portions in its non-flexed condition.

3,899,083
DEVICE FOR DAMPING PENDULUM MOVEMENTS

Hinrich Flessner, and Bernhard Hoffmeister, both of Wilhelmshaven, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Mar. 22, 1973, Ser. No. 343,886
Claims priority, application Germany, Mar. 24, 1972, 2214348
Int. Cl. B66c *19/00*
U.S. Cl. 212—14 **7 Claims**

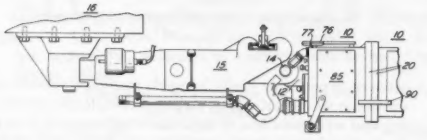


1. A hoist structure including:
a first frame,
a load supporting second frame which is suspended from said first frame,
by means of two pairs of lifting cables of a hoisting drum means mounted on said first frame,
and by means of two pairs of pulleys independently rotatable journalled upon said second frame,
the pulleys of each said pair having a common axis of rotation and being arranged with a distance from one another, the two axes of rotation of said two pairs of pulleys being arranged horizontal and parallel to one another,
each pair of said cables leading from said first frame downwards to the pulleys of one of said pairs in such arrangement,
so that each of the cables of each said pair of cables is passed around a pulley of one of said pairs of pulleys,
the cables of each pair ascending from its pair of pulleys in two strands to a fastening means of said first frame in two spaced points,
said strands of each said pair of cables lying nearly within a plane parallel to said axes of rotation of said pairs of pulleys and inclined with respect to said axes,
said two strands of each pair crossing between said first and second frames in such a manner; that in response to swinging movement of said second frame parrallel to said axes, the pulleys of each of said pairs of pulleys are rotated in opposite directions,
a damping means being operatively interposed between the pulleys of each said pair of pulleys
and comprising a fluid displacement means including at least one pair of displacing members one of which is hollow and connected to one pulley of the same pair of pulleys, the other displacing member of the same pair of displacing members being guided within said first displacing member and connected to the other pulley of the same pair of pulleys,
said fluid displacement means including at least two volumes each being enclosed by at least one said pair of displacing members and filled with fluid,
a conduit means interconnecting said two volumes and including choke means
in such an arrangement that rotation of said pulleys of the same pair of pulleys in opposite directions will cause relative movement of said two displacing members so that a portion of said fluid will flow from one of said volumes through said conduit means and through said choke means to the other said volume.

3,899,084
CAR COUPLER

George W. Gobrecht, Broomall, Pa., and Robert T. Reed, Moorestown, N.J., assignors to Walton Products, Inc., Broomall, Pa.

Filed July 19, 1974, Ser. No. 490,036
Int. Cl. B61g *3/10*
U.S. Cl. 213—100 R **12 Claims**

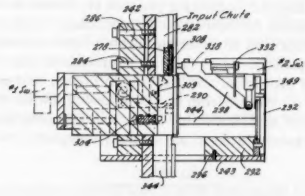


1. Apparatus for controlling the uncoupling of railway vehicles which comprises for each of the vehicles to be coupled
a housing at an end of the vehicle to be coupled to another vehicle,
said housing having a resiliently biased coupling hook carried therein having a position for coupling engagement and an out of engagement position,
said coupling hook having a vertically disposed pulling face and vertically disposed control face,
a cam carried in said housing engageable with said control face for moving said coupling hook to an out of engagement position,
a pawl in engagement with said cam for actuating said cam, and
means for moving said pawl for operating said cam.

3,899,085
INTEGRATED CIRCUIT HANDLING SYSTEM

John J. Chaparro; Lowell V. Ellis, both of San Diego; Doyle W. Meanor, Lakeside; William D. Morton, Jr.; Bernd H. Richelmann, both of San Diego; George B. Ross, Mill Valley, and John E. Toth, San Diego, all of Calif., assignors to Delta Design, Inc., La Mesa, Calif.

Division of Ser. No. 44,401, June 8, 1970, Pat. No. 3,677,401.
This application Mar. 2, 1972, Ser. No. 231,421
Int. Cl. B23q *7/06*
U.S. Cl. 214—1 BB **10 Claims**



1. A handling device for component carriers comprising:
a. a housing;
b. a handling mechanism disposed within said housing including means comprising a vertical chute and a stop in fixed position in said chute for receiving carriers and positioning said carriers at a first level at an initial station, a horizontally reciprocating transporter in horizontal alignment with said initial station for moving said carriers horizontally from said stop to a second station at a second level wherein carriers are in position for making contact with a test contactor, said transporter being movable in

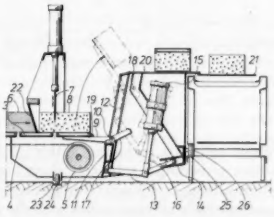
the opposite horizontal direction away from said test contactor to a third station in vertical alignment with said initial station; and a quick releasable connector assembly on said housing having a passage therethrough for said carriers in vertical alignment with said chute, said assembly comprising a stationary part attached to the housing and a movable part, one of said parts having an elongated opening therein and a post on the other of the parts having a sliding engagement with said opening, a yieldable cam follower on the part which has the opening therein at a location overlying said opening, a cam surface on the post in a position for engagement with said cam follower, and complementary interlocking elements respectively on said cam follower and said post having a yieldable locked relationship when said movable part is in engagement with said stationary part.

3,899,086

APPARATUS FOR REMOVING CHEESES FROM CHEESE MOULDS

Olavi Reijonen, and Lauri Kostiainen, both of Helsinki, Finland, assignors to MKT-Techtaat OY, Helsinki, Finland

Filed June 5, 1973, Ser. No. 367,223
Int. Cl. B65g *65/04*
U.S. Cl. 214—1 Q **4 Claims**



1. Improvement in an apparatus for removing cheeses from rectangular, large cheese molds lying side by side, in which moulds the bottom is composed of rectangular plates and one end of the mould has been constructed to constitute a door through which the bottom plates of the mould and the cheese bolster resting thereupon can be extracted from the mould by the aid of a traction member such as a rope or chain, said traction member being attached at one end to the plate furthest from said door and at the other end to a winch constructed to be a carriage transportable from one cheese mould to another and having a tray for receiving one cheese at a time, wherein the improvement comprises a track for the winch carriage located in front of the cheese moulds, a conveyer for the cheeses beside said track and running parallel therewith, said tray mounted on said carriage and comprising a lever and a shaft turnably mounting said lever which upends the cheese together with the accompanying bottom plate and drops them onto a supporting surface on the winch carriage or directly onto the cheese conveyer.

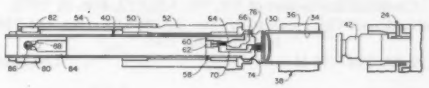
3,899,087

ARTICLE POSITIONING MECHANISM INCORPORATING VACUUM HOLDING AND PRESSURE EJECTION

George D. Tamble, San Pedro, and Frederick C. Olsen, Huntington Beach, both of Calif., assignors to Standun, Inc., Compton, Calif.

Filed Jan. 28, 1974, Ser. No. 437,382
Int. Cl.[2] B21D *43/28*
U.S. Cl. 214—1 BT **6 Claims**

5. In a vacuum supplied gripping device for selectively vacuum retaining workpieces; the combination of: vacuum pad means for contacting and vacuum gripping a workpiece upon vacuum being supplied thereto; a venturi normally having a full main fluid flow therethrough and exhausting therefrom; vacuum line means communicating intermediate said venturi normally creating a vacuum flow in said vacuum line means during said full main fluid flow through said venturi, said vacuum line means communicating with said vacuum pad means normally supplying said vacuum for said pad means vacuum gripping; said vacuum pad means, said venturi and said vacuum line means being mounted as a unit on movable frame means movable forwardly and rearwardly in a defined reciprocal path, said movable frame means including a side surface at said unit; said venturi including a fluid exhaust line operably connected thereto receiving said exhaust of said



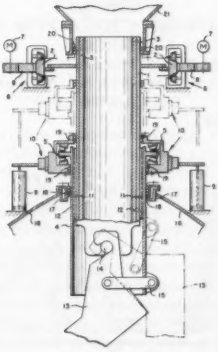
main fluid flow, said fluid exhaust line opening through said side surface of said movable frame means spaced from said venturi; diverting means operable for closing off a portion of said exhaust of said full main fluid flow from said venturi sufficient to divert at least a portion of said full main fluid flow through said vacuum line means to said vacuum pad means changing said vacuum flow to a reverse positive pressure fluid flow to said vacuum pad means, said diverting means being mounted stationary at a determined location of said unit reciprocal path for registering with said side surface of said movable frame means and over said fluid exhaust line opening to close off at least a portion of said fluid exhaust line opening at said determined location.

3,899,088

FURNACE CHARGING APPARATUS

Shoji Furuya, Tokyo; Masaoki Takahashi, and Masatoshi Matsushima, both of Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1974, Ser. No. 437,809
Claims priority, application Japan, Jan. 31, 1973, 48-12649
Int. Cl. F27b *1/20*
U.S. Cl. 214—35 R **3 Claims**



1. Mechanism for charging a furnace with raw materials through a top opening comprising a distribution chute positioned in the upper portion of the furnace adjacent the opening, means for mounting said chute for rotation about the vertical axis of the furnace and for independent angular adjustment with respect to said axis, a pair of concentrically arranged cylinders positioned exteriorally of said furnace and

aligned with said vertical axis, said cylinders being connected for rotation together and slideable movement with respect to each other, first power means for rotating said cylinders, second power means for slideably moving one cylinder with respect to the other, means connecting one of the cylinders with the chute to rotate the latter upon operation of said first power means, and means connecting the other cylinder with the chute for angular adjustment of the latter upon operation of said second power means.

3,899,089

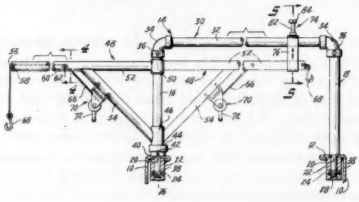
REMOVABLE MOUNTED HOIST FOR PICK-UP TRUCK

N. J. Wardlaw, 3100 Pine Ave., Waco, Tex. 76708

Continuation-in-part of Ser. No. 439,953, Feb. 5, 1974, abandoned. This application June 28, 1974, Ser. No. 484,258

Int. Cl. B60p *1/46*

U.S. Cl. 214—75 H **12 Claims**



1. A hoist assembly for removably mounting on the sideboards of a pick-up truck box, said sideboards having upwardly opening socket means mounted thereon, and said hoist assembly comprising: a pair of vertical standards, the lower ends of said standards being receivable within said upwardly opening socket means; a bridging member connecting the upper ends of said vertical standards; a boom assembly mounted for rotation about one of said vertical standards, and including a horizontally extending boom, said boom assembly being swingable between a position wherein said horizontal boom extends outwardly from said truck box to a position wherein it lies beneath said bridging member; and cable and winch means carried by said boom assembly for lifting objects to be loaded into or unloaded from said truck box.

3,899,090

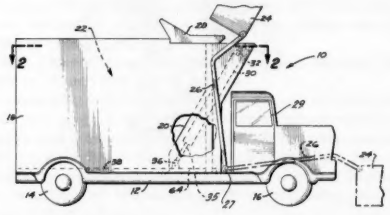
PACKER PLATE GUIDE FOR REFUSE COLLECTION VEHICLES

George O. Telesio, 7709 S. Milna Ave., Whittier, Calif. 90601

Filed Oct. 29, 1973, Ser. No. 410,766

Int. Cl. B30b *15/06*

U.S. Cl. 214—82 **10 Claims**



1. A refuse collection vehicle including a storage bin, a packer plate in the interior of the storage bin, and means for slidably mounting the packer plate for essentially translatory movement lengthwise of the storage bin, the mounting means including at least one elongated fixed guide member located in the bin to be exposed to contact with contents of the bin, a guide member support disposed in the storage bin as an element of the structure thereof for positioning the guide member along the length of the bin, the fixed guide member being disposed principally between the interior of the bin and the support and being releasably secured to the guide member support to be removable therefrom without disturbing the structural integrity of the bin, shoe means affixed to the packer plate and slidably engaged with the guide member to guide movement of the packer plate along the guide member, a first galvanized interface between the guide member support and the fixed guide member, and a second galvanized interface between the shoe means and the fixed guide member.

3,899,091

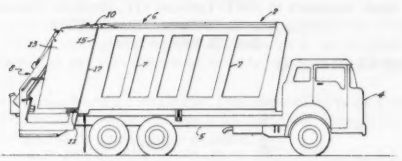
REFUSE COLLECTION APPARATUS

Fred T. Smith, Dearborn Heights, Mich., assignor to Sargent Industries, Inc., Los Angeles, Calif.

Filed June 19, 1972, Ser. No. 264,021

Int. Cl. B65f *3/00*

U.S. Cl. 214—83.3 **79 Claims**



1. In a refuse collector including a storage body, and a tailgate structure providing a relatively short loading hopper having a bottom surface continuous through an arc symmetrical about a substantially vertical radius with the hopper positioned rearwardly of and adjacent to an opening into said storage body;

apparatus for moving refuse from said hopper into said body comprising:

an upper panel extending across the width of said hopper and movably mounted above and longitudinally of said hopper for movement as a unit in the longitudinal and vertical directions relative to said hopper;

mounting means operatively coupled to said tailgate structure and said upper panel in a particular relationship for providing a movement of the upper panel as a unit in a rearwardly and downwardly convexly curved path from an upward and forward position to a lowered and rearward position;

a lower panel having an upper edge pivotally connected to the lower edge of said upper panel;

pivotal mounting means operatively coupled to the lower panel for providing a rotary motion of the lower panel about the pivotal connection between the lower and upper panels as a fulcrum through a continuous arc symmetrical about a substantially vertical radius; and

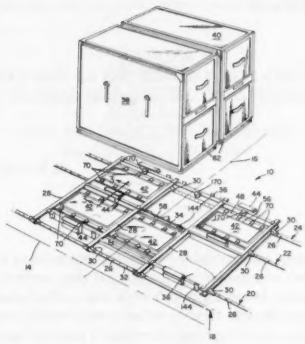
means to actuate said upper and lower panels in the sequence of rotating said lower panel rearwardly, through the continuous arc symmetrical about the substantially vertical radius, with said upper panel positioned in the upward and forward position, moving said upper panel as a unit in a rearwardly and downwardly convexly curved path to the lowered and rearward position, rotating said lower panel forwardly, through the continuous arc symmetrical about the substantially vertical radius, with respect to said upper panel with the lower edge of said lower panel in close proximity to the bottom curved surface of said hopper and with the upper panel in the lowered and rearward position, and moving said upper panel in a forwardly and upwardly curved path to move refuse through said opening into said truck body.

3,899,092

CARGO-CARRYING STRUCTURAL MODULES

Arnold B. Nordstrom, 3855 Paseo de las Tortugas, Torrance, Calif. 90505

Filed July 3, 1973, Ser. No. 376,122
Int. Cl. B60p 1/00
U.S. Cl. 214—84 9 Claims



1. A load-carrying system for vehicles carrying cargo containers and having floor structure including a major axis, a minor axis and a plurality of spaced-apart rails secured to said floor structure substantially parallel to said major axis, said rails being spaced apart by a distance greater than the width dimension of the cargo containers measured along said minor axis, said load-carrying system comprising:

at least two transverse beams;

first fastening means connecting said transverse beams to said rails substantially normal thereto, said first fastening means maintaining said transverse beams in spaced-apart relationship and above said floor structure;

at least two longitudinal beams;

second fastening means connecting said longitudinal beams to said transverse beams substantially normal thereto, said second fastening means maintaining said longitudinal beams in spaced-apart relationship and above said floor structure, said longitudinal beams being spaced to coincide with the width dimensions of the cargo containers;

stop means provided on at least some of said longitudinal beams for maintaining a cargo container in position thereon; and

means normally supporting said container in spaced relationship above said longitudinal beams, said supporting means including resilient means which carry a predetermined load imposed by said container, said resilient means transferring loads exceeding said predetermined load directly to said longitudinal beams.

3,899,093

ANTI-TIPPING LOG SKIDDER

Jan K. Allen, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 18, 1973, Ser. No. 352,360
Int. Cl.[2] B60P 1/00
U.S. Cl. 214—85.5 7 Claims

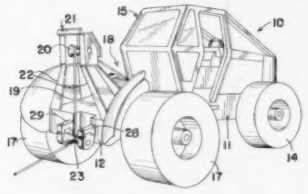
1. A log skidder disposed on a longitudinal axis thereof comprising

a frame,

a towing winch mounted on said frame and having a cable wrapped thereon,

first cable guide means mounted on and vertically above said frame and positioned rearwardly of said towing winch, said cable received and guided over said first cable guide means, and

second cable guide means fixedly mounted on said frame substantially below said first guide means and constructed to define an opening for selectively permitting said cable to be placed thereunder from said first guide means to substantially shorten the tipping moment arm of said log skidder during selected phases of operation thereof, said second cable guide means comprising a roller rotatably



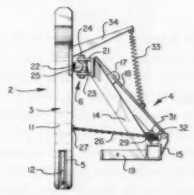
mounted on and between a pair of first and second support brackets and wherein said first bracket is attached to said frame by releasable fastening means and said second bracket is pivotally mounted on said frame by pivot means whereby release of said releasable fastening means will permit said roller to be pivoted along with said second bracket about said pivot means on said frame to allow insertion of said cable under said roller.

3,899,094

MATERIAL HANDLING APPARATUS

John Charles Youl, Symmons Plains, Perth, Tasmania, Australia

Filed Dec. 5, 1973, Ser. No. 422,079
Claims priority, application Australia, Dec. 6, 1972, 1509/72
Int. Cl. B66c 1/62
U.S. Cl. 214—147 G 8 Claims



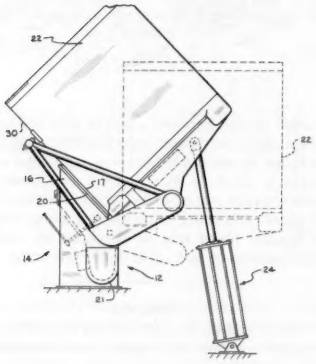
1. Material handling apparatus including: a support frame attachable to a vehicle or prime-mover; a jaw assembly comprising two gripping jaws which are pivotally connected for relative movement towards and away from each other; each said jaw having a blade section which is curved so as to define an inner concave surface arranged in opposed relationship to the corresponding surface of the other said blade section, and an arm rigidly secured to said blade section and extending away therefrom, each said arm and associated blade section being located on the opposite sides respectively of said jaw pivot; actuating means connected between said jaw arms and being operable to cause relative pivotal movement of said jaws; mounting means connecting said jaw assembly to said frame to permit movement of said assembly relative to said frame about at least two axes, one of which extends substantially upright and is transverse to the other of said axes; and flexible restraining means interconnecting said blade sections and mounted to freely move around a portion of said frame so as to limit movement of said jaw assembly to said frame in one direction about the other of said axes of said mounting means while allowing free movement of the jaw assembly about the one axis in both directions.

3,899,095

DOOR CLOSING ASSEMBLY FOR MATERIAL HANDLING SYSTEMS

Delmar R. Wiese, Blue Springs, Nebr., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed Dec. 17, 1973, Ser. No. 425,110
Int. Cl. B67d 5/06
U.S. Cl. 214—302 3 Claims



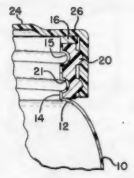
1. In a material handling system which includes a material receiving hopper having a rear wall and a front wall formed with an inlet opening, a bin having a discharge opening and a door hinged at the upper end thereof so that it is pivotally movable between closed and open positions with respect to said discharge opening, said bin being positioned against said hopper front wall so that said bin discharge opening is in registry with said hopper inlet opening and said bin door can pivot to open positions in which said door extends into said hopper, extensible means mounted on said hopper back wall and engaged with said bin door below said hinged upper end thereof when said door is in said closed position, said extensible means being retractable away from said hopper front wall while continuously engaged with said bin door to thus enable said door to pivot from said closed position to a plurality of open positions in which said door is moved varying distances away from said discharge opening so that the extent of opening of said door can be used to control the rate of flow of material from said bin into said hopper, said extensible means being extendable toward said hopper front wall while engaged with said bin door to thereby move said door toward said closed position thereof said hopper front wall being inclined downwardly and forwardly and said bin door being similarly inclined downwardly and forwardly in the closed position thereof so that the weight of the bin contents will constitute a force tending to move the door to its open position, and the portion of said hopper back wall on which said extensible means is mounted being substantially parallel to said front wall, said extensible means being substantially perpendicular to said bin door in the closed position thereof so that the closing force applied to said door by said extensible means is likewise substantially perpendicular to said door in the closed position thereof.

3,899,096

REFORMED PLASTIC ARTICLE AND METHOD OF MANUFACTURE

Leslie Stephan Marco, Oakland, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 232,456, March 7, 1972, Pat. No. 3,787,547. This application Aug. 22, 1973, Ser. No. 390,649
Int. Cl. B65d 41/08
U.S. Cl. 215—31 1 Claim



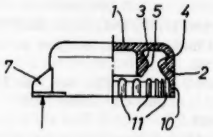
1. A composite container assembly comprising a container portion and an annular relatively rigid ring portion, said container portion being formed from a thin-walled plastics material with insufficient rigidity to be formed with properly functioning cap attaching formations for a closure cap, said container portion comprising a body section, a neck section integrally formed on the upper end of said body section, and a flange section integrally formed on the upper end of said neck section, said body section immediately below said neck section having a shoulder extending substantially radially outwardly of said neck section, the outer diameter of said ring portion being less than the outer diameter of said shoulder of said body section, said ring portion disposed circumferentially about said neck section with the lower end of said ring portion vertically abutting said shoulder, said ring section having external cap attaching formations extending outwardly thereof, said flange section immediately overlying and positioned against the upper end of said ring portion, the outer diameter of said flange section being substantially less than the radially outward extension of said external cap attaching formations, said flange section being sufficiently flexible to provide a seal between an applied closure cap and the interior of said container portion, indentations formed in the inner surface of said ring portion, and portions of said neck section indented into said indentations to lock said ring portion against rotation relative to said neck section.

3,899,097

PLASTIC CLOSURE CAP FOR A CONTAINER

Dietmar Aichinger, Arlesheim, Switzerland, assignor to Albert Obrist & Co., Reinach, Switzerland

Filed May 2, 1974, Ser. No. 466,194
Claims priority, application Switzerland, May 9, 1973, 6556/73
Int. Cl.[2] B65D 41/32
U.S. Cl. 215—253 3 Claims



1. A closure cap formed of plastic for use with a container, especially a flask or bottle, comprising a closure cap having a cap body, a cap lift-off nose extending away from the outer periphery of the body of the closure cap, at least one reference rupture location provided for said closure cap, said reference

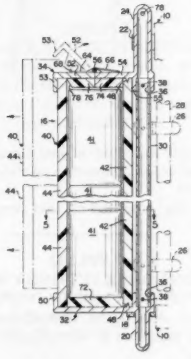
rupture location tearing upon removal of the closure cap from the container, the region of the closure cap containing said reference rupture location forming a part of the closure cap which can be removed as a unit together with the cap lift-off nose, said closure cap including at least one lateral connection surface extending between the cap lift-off nose and the outer periphery of the body of the closure cap, said at least one reference rupture location comprising at least one reference rupture line provided at said lateral connection surface.

3,899,098

PORTABLE INSULATED CARRIER FOR CONTAINERS

Walter J. Hutchins, 42 Bishop Rd., West Hartford, Conn. 06119

Filed Jan. 2, 1973, Ser. No. 320,443
Int. Cl. B65d *7/00, 25/00*
U.S. Cl. 220—4 B **4 Claims**



1. A carrier for one or more container, the carrier comprising a hollow casing having separable sections each extending between opposite end portions of the casing, for encasing the containers when the sections are operatively assembled and for facilitating loading and unloading of the containers when the sections are separated, end pieces, one for each of said end portions of the casing, said end pieces being operatively fixedly secured to a first of said sections, a first of said end pieces having means in the form of a hinged portion releasably holding a second of said sections in operative assembly with the first section and for releasing the second section from the first section with the end pieces retained in said operative assembly, to facilitate loading and unloading of the containers.

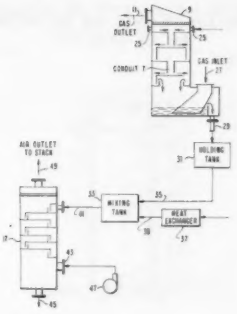
3,899,099

INERT GAS SYSTEM AND METHOD FOR TANKERS

Andrew Oiestad, Staten Island, N.Y., assignor to Tank Sapp (UK) Ltd., Croydon, England

Filed June 21, 1973, Ser. No. 372,077
Int. Cl.[2] A62C *3/10;* **B01D** *47/02;* **C01B** *17/60*
U.S. Cl. 220—88 B **5 Claims**

3. In a process for providing an inert gas blanket to reduce the oxygen concentration in fuel oil storage tanks aboard ship to an amount not greater than about 12% by volume, wherein a flue gas containing sulfur dioxide is treated with sea water to reduce the sulfur dioxide concentration of said flue gas sufficiently to prevent the gas from causing corrosion of the storage tanks, the treated gas is distributed to the storage tanks aboard ship to provide an inert gas blanket, and the sea water used to remove the sulfur dioxide from the flue gas is discharged into the water surrounding the ship, the improvement comprising reducing the concentration of sulfur compounds in said water to a non-polluting level by contacting said water with a countercurrent stream of air in an amount and at a temperature sufficient to reduce the level of concentration of sulfur compounds to the desired level prior to discharging the sea water effluent to the water surrounding the ship.

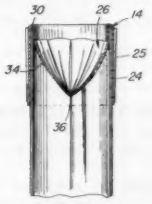


3,899,100

CONTAINER FOR PACKAGING AN OBJECT

Raymond L. Rigaud, Shrub Oak, N.Y., assignor to Tiros Plastics Corporation, White Plains, N.Y.

Filed July 20, 1973, Ser. No. 381,247
Int. Cl. B65d *51/12, 85/70, 85/58*
U.S. Cl. 220—229 **4 Claims**



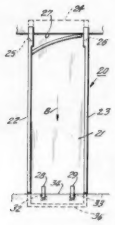
1. A container for packaging an object, comprising:
a tube having at least one open end;
an end cap mounted on the open end of said tube, said end cap having an end wall in the shape of a cup extending inwardly of said tube and a sidewall skirt depending from said end wall, said skirt being shaped to slip over the tube, an annular groove located between said skirt and said end wall for frictionally receiving the end of said tube, said end wall being divided into a plurality of resilient triangular segments separated by radial slits which meet in the center of said end wall, said triangular segments tapering in thickness toward the center of the end wall and being deflectable inwardly of the container to allow an object to be inserted through the end wall into the container, said triangular segments being biased to resiliently return to their original position after an object has passed into the container through said cap to prevent escape of the object from the container said triangular segments including a central radial rib which increases in height from the surface of the tapered segments in direct proportion to the reduction in thickness of the segments to maintain a constant thickness of material along the radial center portion of said segments.

3,899,101

PLASTIC FILLER WITH INTEGRAL BIAS MEANS

John H. Keating, Berlin, and Alfred E. Chase, Jr., Blackwood, both of N.J., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed July 11, 1974, Ser. No. 487,468
Int. Cl. H02g *3/14*
U.S. Cl. 220—241 **10 Claims**



1. A filler for an opening in a trim plate, said filler including an elongated rectangular plate-like portion having first and second relatively short edges at opposite ends of said portion, first retaining formation means at said first edge defining a relatively shallow plate receiving first recess means at one of said ends and having an opening facing said first edge, second retaining formation means at said second edge defining a relatively deep plate receiving second recess means at the other of said ends and having an opening facing said second edge, an element mounted to said portion and positioned to engage a trim plate edge entered into said second recess means, biasing means acting on said element to create a reaction force which urges said filler away from a trim plate edge entered into said second recess means whereby another trim plate edge becomes more deeply positioned in said first recess means.

3,899,102

CUP DISPENSER WITH RECIPROCATING ACTUATOR

Bryan E. C. Lack, and Alec T. Newman, both of Banbury, England, assignors to General Foods Corporation, White Plains, N.Y.

Filed Jan. 26, 1973, Ser. No. 327,040
Int. Cl. B65g *59/10*
U.S. Cl. 221—6 **1 Claim**

1. A mechanism for dispensing individual cups which comprises:

a. a base plate, said base plate having a delivery aperature therein, said delivery aperature being of circular cross-section just slightly larger than the cups to be dispensed;

b. four pinions mounted symmetrically on the base plate around the periphery of the aperature, each of said pinions having first and second axially spaced and circumferentially staggered detents, the first detent cooperating to retain a cup and the second detent cooperating to retain a cup;

c. a frame member mounted on said base plate for rectilinear sliding movement, said frame member having a pair of racks flanking opposite sides of the aperature, each of said racks engaged with two of the pinions for rotation thereof during rectilinear sliding movement of the frame member;

d. means for providing rectilinear sliding movement to the frame member, said means comprising:

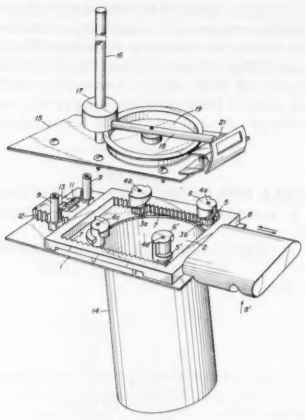
1. an extension of the frame member in the form of a handle with a grippable indentation; and

2. a non-return pawl and ratchet mechanism attached to an outer side of the frame member;

e. a top plate mounted above the slidable frame member; said top plate having an indicator plate hinge mounted thereon;

f. a cup stack support mounted on said top plate, said cup stack support comprising:

1. a vertically disposed elongated rod;



2. an arm slidably mounted on said elongated rod, said arm having an extension adapted to operate the hinged indicator plate; and

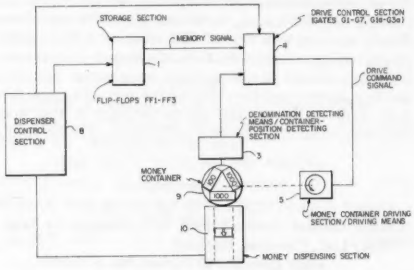
3. a weighted disc mounted on said arm.

3,899,103

MONEY CONTAINER SETTING CIRCUIT IN AN AUTOMATIC MONEY DISPENSER

Hideto Shigemori; Akio Ueba, and Hisashi Kitagami, all of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 299,402, Oct. 20, 1972, abandoned. This application July 3, 1974, Ser. No. 485,433
Claims priority, application Japan, Oct. 20, 1971, 46-82424
Int. Cl. G07d *1/00*
U.S. Cl. 221—10 **4 Claims**



1. A money container setting system in an automatic money dispenser having a dispenser control section to control the dispensation of money, said system comprising:

a money container having a plurality of money containing frames each containing money of a particular monetary denomination;

driving means for setting each one of said money containing frames containing money of a predetermined monetary denomination to be dispensed at a money dispensing position of said automatic money dispenser;

a money dispensing section for dispensing money out of each one of said money containing frames when set at said money dispensing position;

storage means for storing the monetary denominations of money designated to be dispensed and providing respective denomination storing signals representative thereof; monetary denomination detecting means operatively responsive to said denomination storing signals for detecting the denomination of money contained in each one of said money containing frames when set at said money dispensing position; and

drive control means for applying a driving command signal to said driving means until the denomination of money to be dispensed, which is selected in a predetermined order of priority determined by the denominations stored in said storage means, is detected by said monetary denomination detecting means in response to respective ones of said denomination storage signals, whereby money to be dispensed is successively selected and set at said money dispensing position.

3,899,104

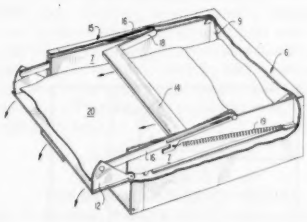
SHEET STORAGE AND DISPENSING CONTAINER

Gabriel Kohner, Hevel Korazim, Israel, assignor to Amiad, Mutzarei Yiul-1972, Hevel Korazim, Israel

Filed Apr. 24, 1973, Ser. No. 353,971

Int. Cl.[2] B65H *3/02*

U.S. Cl. 221—197 **7 Claims**



1. A sheet storage and dispensing unit comprising:

an enclosure frame, including enclosure frame walls;

guides associated with said enclosure frame walls;

a tray slidably displaceable in said guides and being adapted to contain sheets to be dispensed, said tray comprising a floor portion and side wall portions;

a tray closure member pivotally mounted with respect to the enclosure frame and adapted, together with the enclosure frame to enclose the tray completely;

sheet pusher means biased towards said floor portion;

articulated coupling means for coupling the closure member to the sheet pusher means so that pivotal movement of the closure member results in a translational movement of the pusher means;

spring biasing means for coupling the tray to the articulated coupling means so as to spring load the tray in the direction of the closure member upon pivotal opening movement of the closure member; and

abutment means associated with said guides against which said tray is normally biased and with respect to which said tray is manually displaceable so as to clear the abutment means thereby allowing for outward displacement of the tray under its spring loading.

3,899,105

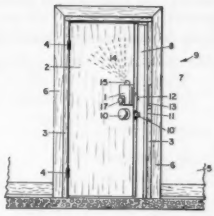
CHEMICAL IRRITANT SPRAY DEVICE

Charles R. Fegley, 1606 Frush Valley Rd., Laureldale, Pa. 19605, and Werner F. Esseluhn, 12 Larchwood Rd., Wyomissing, Pa. 19601

Filed Feb. 20, 1974, Ser. No. 443,981

Int. Cl.[2] B65D *83/14*

U.S. Cl. 222—5 **8 Claims**



1. A chemical dispensing anti-burglar device comprising: a body member, a pressurized container, means for slidably supporting said container in said body member, a fluid passageway in said body member having an open entry section, means for discharging fluid from said container into said open entry section, a spring biasing said container toward said open entry section, means for releasably retaining said container in a cocked position away from said open entry section, said retaining means including a trigger element mounted for movement within said body member between an actuation position and a release position, said trigger element in the actuation position being in engagement with a surface of the container to retain the container in a cocked position, said trigger element in the release position allowing the container to be forced against the open entry section by the spring, whereby the means for discharging fluid causes discharge; means for locking said trigger element in engagement with said container, said locking means being mounted for movement within said body member between a locked position and a release position, said locking means in said locked position securing said trigger element in engagement with said surface of the container, and said locking means in its release position permitting the trigger element to move to its release position; and means external to the body member for releasably retaining the trigger element in its actuation position, said external retaining means including a latching plate mounted separate from the body member, the body member being movable between a first position in which the external retaining means retains the trigger element in its actuation position, and a second position in which the external retaining means allows the trigger element to move to its release position.

3,899,106

LIQUID METERING DEVICE

Edmond Danquechin Dorval, 4, avenue des Arts, Versailles (78) Yvelines, France

Filed Feb. 3, 1971, Ser. No. 112,261

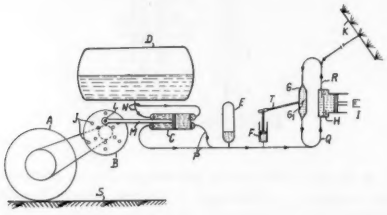
Claims priority, application France, Feb. 16, 1970, 70.05353

Int. Cl. A01c *23/00*

U.S. Cl. 222—177 **7 Claims**

1. A device for the controlled metering of a liquid from a reservoir and for discharging the liquid onto a surface relative to which the device moves, comprising a distributor outlet member for discharging the liquid onto the surface, a flow circuit connecting said reservoir to said distributor outlet member, a first metering pump positioned in said circuit for withdrawing liquid from said reservoir and for discharging the liquid into the circuit downstream of said metering pump, said metering pump operating at a first pressure, first driving means adjustably connected to said metering pump for vary-

ing the amount of liquid discharged by said pump, said first driving means arranged to cooperate with the surface onto which the liquid is discharged and relative to which the device moves for establishing the delivery rate of said metering pump proportional to the relative speed between the device and the surface relative to which it travels, a second pump positioned in said circuit between said first pump and said distributor outlet member, said second pump operating at a second pressure higher than the operating pressure of said first pump, second driving means for said second pump, said second driving means operated independently of and by a different source from said first driving means, a regulating return valve



connected to said circuit in parallel with said second pump, and a pressure sensitive device connected to said circuit downstream from said first pump and upstream from the parallel connection of said second pump and regulating return valve, said pressure sensitive device is coupled to said regulating return valve for controlling said return valve so that the portion of flow through said second pump which passes through said return valve increases or decreases in response to a decrease or increase in the pressure in said circuit, the pressure in said circuit is dependent on the quantity of liquid supplied into said circuit from said first pump and the actual quantity of liquid distributed through said distributor outlet member.

3,899,107

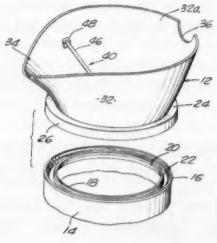
PAINT CAN ADAPTOR

Denes Gaal, 15409 S. Benfield, Norwalk, Calif. 90650

Filed Aug. 12, 1974, Ser. No. 496,401

Int. Cl. B65d *25/48*

U.S. Cl. 222—570 **5 Claims**



1. An attachment for paint cans and the like of the type comprising cylindrical side walls, a bottom and a top having an outer peripheral side wall connecting bead which marginally encompasses the outer periphery of the can, an inner peripheral bead which defines a circular opening in the can and a groove intermediate the inner and outer beads adapted to receive the friction member of a pry-off type lid, said attachment comprising:

a. a connecting web which is generally circular in plan and of a width sufficient to bridge the groove in the top of the can, said connecting web including:

1. an outer peripheral edge provided with a resilient snap fit retainer section which is cannel-shaped in cross-section and adapted to snap over the outer peripheral bead of the can;
2. a depending locating rib which is generally V shaped in cross-section and is adapted to extend into the groove in the top of the can; and
3. an inner peripheral edge which is channel-shaped in cross-section and is adapted to closely fit over the inner peripheral bead of the can;

b. a continuous wall extending upwardly and outwardly from the top surface of said connecting web and terminating in an upper rim, said wall having on one side a marginally projecting pouring spout portion and on the opposite side a first paint brush supporting means in the form of an interruption in the wall adapted to support a paint brush handle; and

c. a second paint brush supporting means carried by said continuous wall intermediate said pouring spout portion and said first brush supporting means for supporting a paint brush at a point adjacent the bristles thereof.

3,899,108

APPARATUS FOR STEAMING AND SMOOTHING OF ARTICLES OF CLOTHING IN A CLOSED CHAMBER

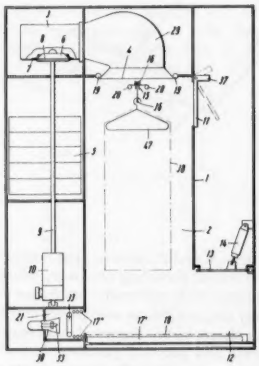
Manfred Frauendorf, Stein, near Nurnberg, Germany, assignor to Normbau GmbH Maschinen-Papparate-Werkzeuge & Co., Stein, near Nurnberg, Germany

Division of Ser. No. 305,253, Nov. 10, 1972, Pat. No. 3,849,815. This application Aug. 12, 1974, Ser. No. 496,886

Claims priority, application Germany, Nov. 12, 1971, 2156405

Int. Cl.[2] A41H *43/00*

U.S. Cl. 223—51 **17 Claims**

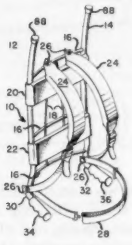


1. In a device for steaming and smoothing clothing in a closed chamber with a lockable processing space and means to supply steam and hot air, the improvement wherein said processing space comprises an hermetically sealed pressure chamber; said device further comprising an excess pressure valve for said pressure chamber, a nozzle arrangement for separate feed of large volume of abruptly decompressed steam, an intermediate steam storage means upstream from said nozzle arrangement, and means for the separate feed of hot or saturated steam at constant pressure.

3,899,109
BACKPACK FRAME WITH HANDLES

Frank M. Noice, 414 E. Mercer, Apt. 3, Seattle, Wash. 98102

Filed Aug. 10, 1972, Ser. No. 279,432
Int. Cl. A45f *3/10*
U.S. Cl. 224—25 A 18 Claims



1. In a backpack frame of the type having a pair of generally vertical main support bars each having upper and lower ends and being interconnected by transverse rods, said frame having an upper mounting means for fastening one end of a pair of shoulder straps, said straps extending forwardly from said frame to mount the frame on the back of a wearer and a mounting means secured to said lower ends of said main support bars, for mounting a lower, body engaging flexible support means, the improvement comprising a pair of handles extending forwardly and outwardly from said lower ends of said vertical main support bars adjacent the hips of the wearer, said handles extending forwardly of the point of connection of said lower body engaging support means to said lower end portions of each of said main support bars and being rigidly connected to said main support bars, said handles functioning structurally only as handles, whereby said handles are accessible to and may be gripped by the wearer and raised to lift the pack upwardly off the wearer's shoulders to temporarily redistribute the pack load.

3,899,110
FOLDABLE CAR TOP CARRIER

Kenneth W. Binding, Woburn, and George A. Laberis, Wakefield, both of Mass., assignors to Beatrice Foods Co., Chicago, Ill.

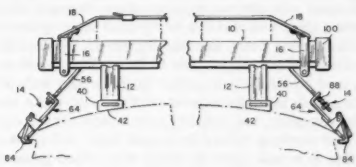
Filed Sept. 10, 1973, Ser. No. 395,948
Int. Cl. B60m *9/04*
U.S. Cl. 224—42.1 F 8 Claims

1. A foldable car top carrier comprising two elongate rigid bars arranged end to end, said bars having top and bottom sides, said top sides being adapted to support a load, legs mounted to the bottom sides of the bars for supporting the bars above the car top, and hinge means connecting the adjacent ends of the bars in abutting relationship; characterized in that the adjacent ends of the bars are oppositely inclined downwardly and toward their respective outer ends and the hinge means connects the bars with the adjacent ends of the inclined ends in abutting engagement and comprises a rigid channel member which receives the lower sides of said adjacent ends of the bars, and pins pivotally connecting said adjacent ends of the bars to said channel member on centers located below the center lines of the bars and equidistant from the ends, wherein said carrier may be folded for compact storage yet does not sag at the hinge when unfolded and loaded.

3,899,111
CAR TOP CARRIER FOR GUTTERLESS CAR TOPS

Kenneth W. Binding, Woburn, and George A. Laberis, Wakefield, both of Mass., assignors to Beatrice Foods Co., Chicago, Ill.

Filed Sept. 10, 1973, Ser. No. 395,949
Int. Cl. B60m *9/04*
U.S. Cl. 224—42.1 F 12 Claims

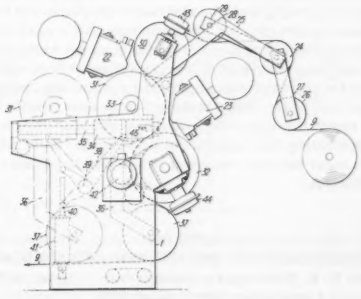


1. A car top carrier for a gutterless car top having ledges at opposite sides thereof, comprising an elongate rigid bar, supports connected to the opposite ends of said rigid bar, retractable hooks and means at the ends of the bar connecting the hooks thereto for adjustment longitudinally of the bar to accommodate to the width of the top, each of said means comprising a rod connected at one end to the bar, a part mounting the retractable hook on the rod for movement therealong, and a nut threaded onto the rod for limiting movement of the part and hook toward the distal end thereof, eccentric means mounting the hooks on the parts, means for actuating the eccentric means whereby the hooks may be extended and retracted at their limiting position on the rods to disengage the hooks from the top in one position and to engage the hooks with the top in the other position, and a distendable spring mounted on one of the rods between the nut and the part connecting the hook thereon such that the eccentric means for effecting retraction of the hooks simultaneously completely compresses said spring, whereby the clamping means rigidly attaches the carrier to the vehicle top.

3,899,112
APPARATUS FOR TREATING WEBS OF MATERIAL

Sven Olof Soren Stark, Sodra Sandby, and Per Allan Ljungberg, Lund, both of Sweden, assignors to Tetra Pak Developpement S.A., Lausanne, Switzerland

Filed Oct. 27, 1972, Ser. No. 301,320
Claims priority, application United Kingdom, Dec. 22, 1971, 59641/71
Int. Cl.[2] B65H *17/20*
U.S. Cl. 226—90 8 Claims



1. Apparatus for advancing a wide web of fragile material under tension by passing the web at substantially constant speed in serpentine manner partially around and between at least three working rollers each extending across, and being in

contact with, the full width of the web, wherein two of said working rollers are located in spaced fixed positions substantially vertically, one above the other, and a third, intermediate, working roller is located, when in operation, adjacent to, and extending partially inwards between said two spaced working rollers, said third, intermediate, working roller being movable, in a substantially horizontal direction, away from its position extending partially inwards between said spaced working rollers, to an open position leaving a free vertical gap between itself and said two spaced rollers, through which the end of the web of material can be lowered under gravitational force, when being fitted into the apparatus, whereafter said intermediate roller is returnable to its working position adjacent to said two rollers in order to guide the web along a serpentine path partially around each of said three working rollers in sequence, and infeed quide rollers on the opposite side of said working rollers from said third roller when said third roller is in said open position, said infeed guide rollers training said web about the upper of said working rollers in all positions of said third roller, the web running over said infeed guide rollers in serpentine manner in passing to the first working roller, the guide rollers being relatively movable to provide a substantially unobstructed path between them for insertion of the web.

3,899,113

EXPLOSIVELY ACTUATED FASTENER DRIVING POWER TOOLS

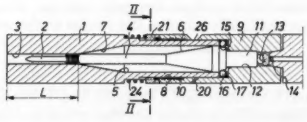
Jacques Brack, Nyon, Switzerland, assignor to Olin Ski AG, Zug, Switzerland

Filed Aug. 3, 1973, Ser. No. 385,557

Claims priority, application Switzerland, Aug. 7, 1972, 11645/72

Int. Cl. B25c *1/14*

U.S. Cl. 227—10 **7 Claims**



1. An explosively actuated fastener driving tool of the type comprising, in combination: a front part and a rear part, means removably connecting said front and rear parts to each other, said front part including an axial bore; a piston rod slidingly mounted in said bore; and stop means including portions projected into said bore in the vicinity of said rear part for cooperating with the rear end of the piston rod to limit its motion toward the rear when said rear part is connected to said front part, said portions of said stop means being slidable out of said bore when said rear part is removed from said front part, said rear part providing between a propelling charge and said rear end of the piston rod a gas expansion chamber, said means removably connecting said front and rear parts to each other permitting axial adjustment between said front and rear parts in order to cause variations in the volume of said expansion chamber.

3,899,114

SOLDERING IRON TIP AND METHOD OF FABRICATION

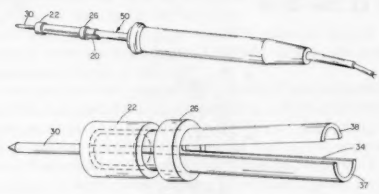
Gunther K. E. Kleeberg, Lexington, Mass., assignor to M. M. Newman Corporation, Marblehead, Mass.

Filed Nov. 4, 1974, Ser. No. 520,677

Int. Cl.[2] B23K *3/02*

U.S. Cl. 228—55 **4 Claims**

1. A soldering iron tip comprising
a headed working element
a split hollow sleeve, and
an apertured cup-shaped coupling connecting said working element and said hollow sleeve together,
the bottom end of said sleeve being seated against the side wall of said coupling and



the working element being seated in said coupling inside of said sleeve with its shank extending through the bottom of said coupling and with the end of said sleeve locked between the head of the working element and the side wall of said coupling.

3,899,115

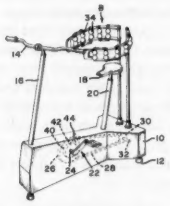
EXERCISE AND MASSAGING APPARATUS

Luther G. Simjian, 7 Laurel Ln., Greenwich, Conn. 06830

Filed July 10, 1974, Ser. No. 487,050

Int. Cl.[2] A61H *1/00*

U.S. Cl. 128—58 **9 Claims**



1. An exercise and massaging apparatus for use by a person comprising: a support structure;
motive means coupled to said structure for being operated by the person;
a massaging belt for being worn by the person and said belt including a plurality of massaging elements mounted upon rotatable shafts supported by said belt, and
means coupling said motive means to said shafts for causing said massaging elements to rotate in substantially stationary position responsive to the operation of said motive means.

3,899,116

METHOD OF VIBRATORY WELDING

Bruce L. Mims, Redding, Conn., assignor to Branson Ultrasonics Corporation, New Canaan, Conn.

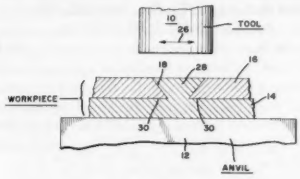
Filed Nov. 29, 1974, Ser. No. 528,271

Int. Cl.[2] B23K *1/06*

U.S. Cl. 228—110 **10 Claims**

1. The method of producing a welded connection by high frequency vibratory welding comprising the steps of:
superposing an apertured termination upon a non-apertured termination;
disposing said terminations between an anvil and a tool adapted to vibrate at a high frequency;
applying a static clamping force between said terminations for causing the abutting surfaces of said terminations to be in intimate contact with one another, and
while said static force is applied causing said tool to undergo high frequency vibrations in a direction normal to said static force whereby to cause material from said non-

apertured termination to penetrate into the aperture of said apertured termination, and terminating said vibrations and said force when said material has penetrated into said aperture.

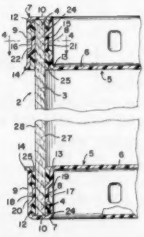


3,899,117

PLASTIC END CAP AND PAPER BODY ATTACHMENT

Harry A. Peyser, Olympia Fields, and Robert D. Heaviside, Winnetka, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Mar. 14, 1974, Ser. No. 451,334
Int. Cl. B65d *3/12*
U.S. Cl. 229—5.5 **9 Claims**



1. An end closure for a can body having a peripheral end edge portion, said closure being formed of plastic material and having a peripheral edging for axially telescoping over said edge portion, said edging comprising a pair of opposed walls and an intervening web defining an edgeportion admitting groove, a plurality of aligned opposing small nibs projecting from said walls into the groove and spaced lengthwise of the groove adapted for grasping engagement with the edge portion of an associated can body and operative to hold said walls apart in spacial relation to provide passage means between the walls and sides of the can body for reception of sealing compound therein on both sides of said edge portion.

3,899,118

SELF-DISPENSING DISPENSER

Paul Hollinger, Randallstown, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

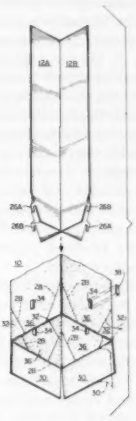
Filed July 24, 1974, Ser. No. 491,525
Int. Cl. B65d *5/72*
U.S. Cl. 229—17 B **9 Claims**

1. A compartmented carton for stacked nested articles convertible to a dispenser for said articles at a desired point of use, comprising:

an elongated container having substantially rectangular sidewalls;

one end of said container having closure flaps and the end corner portions of said sidewalls defined by aligned perforations permitting removal of said flaps and said end corner portions to provide substantially symmetrically tapered flaps at the said one end of each of said sidewalls; said tapered flaps being so tapered as to readily converge one with the other to form a constricted end opening in said carton;

insertable means in said carton defining a plurality of comparments therein with said sidewalls for holding a like plurality of stacks of said nested articles and having convergent surface portions adjacent said tapered flaps on said sidewalls conforming to the degree of convergence of said flaps; and retaining means engaging said tapered flaps and retaining said flaps against said convergent edge portions to provide a restricted dispensing opening for each of said compartments in said carton.

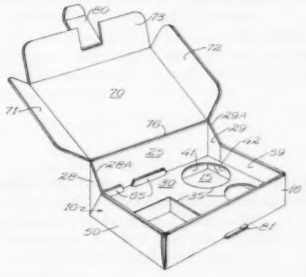


3,899,119

SNACK TRAY CARTON

Harry I. Roccaforte, Western Springs, Ill., assignor to Hoerner Waldorf Corporation, Saint Paul, Minn.

Filed Oct. 17, 1974, Ser. No. 515,588
Int. Cl.² **B65D** *5/50, 5/66*
U.S. Cl. 229—29 F **4 Claims**



1. A compartmented snack tray adapted to be folded from a substantially flat piece of foldable paperboard or similar sheet-like material, said snack tray comprising:

a substantially rectangular bottom panel having parallel front and back edges, and parallel side edges arranged perpendicular to said front and back edges;

a front wall panel, rectangular in shape, hingedly connected to said bottom panel and oriented perpendicular to said bottom panel in an upright position, said front panel having a predetermined height;

front panel tuck flaps hingedly connected to the lateral sides of said front panel and folded inwardly to a position parallel with said side edges of said bottom panel;

a rectangular back panel formed in height greater than said front panel and hingedly connected to said back edge of said bottom panel and oriented in an upright position perpendicular to said bottom panel;

back panel tuck flaps hingedly connected to each lateral edge of said back panel, said back panel tuck flaps having an angled portion on the top edge thereof terminating in a rectangular area of said back panel tuck flaps formed in height substantially equal to the height of said front panel, said back panel tuck flaps folded inwardly to lie parallel with said side edges of said bottom panel;

a compartmented snack tray platform, substantially rectangular in shape, hingedly connected to said front panel along that edge parallel and opposite to said bottom panel, said platform having formed on the remaining three sides thereof spacer support flaps which are folded down to space said platform a predetermined distance away from said bottom panel;

locking flaps hingedly connected to said side edges of said bottom panel having a first side wall section folded upwardly on the outside of said front and back panel tuck flaps and an inwardly folding locking section foldable over and into overlapping relationship with the inside of said front and back panel tuck flaps to lock the tray in the erected position and retain said snack tray platform in parallel position spaced from said bottom panel;

said side panel locking flaps having an angled portion in said first section to space said second locking section away from said angled portion in said back panel tuck flap; and

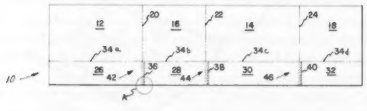
a snack tray cover including a top panel formed in size substantially equal to said bottom panel; said top panel having front and side tuck-in flaps adapted to be folded inwardly and be tucked in when said top panel is folded over said carton, said top panel flaps resting inwardly of said front panel and said bottom panel side flaps.

3,899,120

PAPERBOARD BLANK WITH CRUSHED OFFSET FLAP EDGES AND METHOD FOR FORMING SAME

Eli H. Fradkin, Lambertville, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed June 3, 1974, Ser. No. 475,790
Int. Cl. B31b *1/14*; **B65d** *5/20*
U.S. Cl. 229—32 **10 Claims**



1. In a paperboard blank particularly adapted for use with an automatic erection machine and foldable into a tubular configuration of the type wherein flaps are connected to at least one main panel along fold lines and wherein said flaps are separated from one another by offset slit lines extending from the fold line connecting said flaps to said main panel to the outer marginal edge of said flaps, the improvement in said blank which comprises:

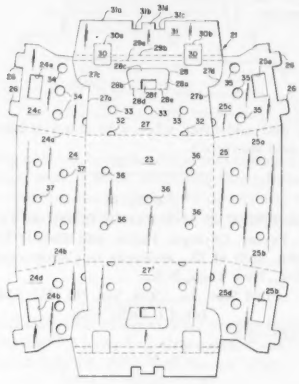
a crush line, substantially coextensive with said offset slit lines, said crush line defining an area of said paperboard blank that is substantially thinner than the original thickness of said paperboard blank and at least twice as wide as the amount of offset of said offset slit lines.

3,899,121

INTERLOCKING CONTAINER

Stephen A. Herbetko, Philadelphia, Pa., assignor to Connelly Containers, Inc., Bala Cynwyd, Pa.

Filed Oct. 11, 1973, Ser. No. 405,729
Int. Cl.[2] **B65D** *5/30*, *21/04*
U.S. Cl. 229—34 R **18 Claims**



1. A container comprising a bottom and side walls and end walls upstanding therefrom,

a side wall flap connected with a side wall and disposed inwardly of said end wall, said end wall and flap being in adjacent parallel relationship,

an opening in said side wall flap,

a locking member having first leg means extending from said end wall and through said opening in said side wall flap and having a second leg transverse thereto, said second leg lying inwardly of said side wall flap and spaced therefrom to provide an opening between said second leg and said side wall flap,

said end wall having a flap connected to the upper margin thereof and depending interiorly of said side wall flap,

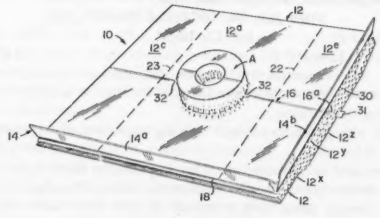
said end wall flap having a tab extending into said last mentioned opening and captured by said second leg of said locking member.

3,899,122

PACKAGE WITH TEAR ELEMENT

Ridley Watts, Jr., Cleveland, Ohio, assignor to American Packaging Corporation, Hudson, Ohio

Division of Ser. No. 52,782, July 6, 1970, abandoned, which is a continuation-in-part of Ser. No. 17,575, March 9, 1970, abandoned. This application Sept. 18, 1972, Ser. No. 289,868
Int. Cl. B65d *5/36*, *65/16*, *75/58*
U.S. Cl. 229—41 B **2 Claims**



1. A blank for forming a box adapted to contain a product adhered against a single flat surface portion of the blank by a

thermoplastic film, said blank being comprised of corrugated cardboard shaped and scored to facilitate being folded to form a box and including a portion defined by score lines and under which all other portions of the blank can be folded, and a thermoplastic adhesive coating adhered directly to said surface portion and covering only said surface portion, said adhesive coating containing throughout its mass a visible infrared-radiation-absorbing substance capable of absorbing a substantial portion of infrared radiation directed toward said coating, whereby said surface portion is shielded from radiant heat and said coating can be efficiently heated and softened by infrared radiation.

3,899,123

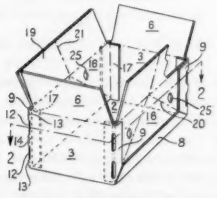
COLLAPSIBLE BLISS-TYPE CONTAINER

Ray H. Stollberg, Concord, and Joseph W. Leaky, Danville, both of Calif., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 297,413, Oct. 13, 1972. This application Sept. 23, 1974, Ser. No. 508,238

Int. Cl. B65d *5/36*

U.S. Cl. 229—41 R **4 Claims**



1. A blank construction for a collapsible container of flexible sheet material having score lines arranged for folding of the container to collapsed condition when empty comprising three blanks securable together; a first of said blanks comprising a central substantially rectangular bottom wall panel, a substantially rectangular side wall panel hingedly connected to each of a pair of opposite edges of the bottom wall panel, a securing flange hingedly connected to each of the remaining edges of said bottom wall panel, and a securing flange hingedly connected to each edge of each side wall panel; a second and third of said blanks, each comprising a substantially rectangular side wall panel and a securing flange hingedly connected to each of opposite edges of each of the latter side wall panels; the securing flanges on said bottom wall panel being securable to the side wall panels of said second and third blanks and the remaining securing flanges of said blanks being at the upright corners of the container when set-up with a pair of flanges at each corner, one of such corner flanges being an inside flange for adhesive bonding to the inside surface of the adjacent side wall panel, and the other of said flanges at each corner being an outside flange for adhesive bonding to the outside surface of the adjacent side wall panel; each of the hinge connections of said outside securing flanges including spaced apart relief slots coincident with said hinge connection to allow at least partial closing of the slots and thus relieve stress at the corner when stress is placed on the corner as the container is collapsed from set-up condition.

3,899,124

REINFORCED AUTOMATIC BOTTOM CLOSURE

John D. Desmond, and Joseph J. Hart, both of Philadelphia, Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed Nov. 8, 1974, Ser. No. 522,020

Int. Cl.² B65D *5/36*

U.S. Cl. 229—41 B **4 Claims**

1. In a heavy-duty, collapsible carrying carton adapted to be brought from a collapsed condition to an erected condition by the application of pressure against two diagonally opposed corners thereof and being formed from a unitary blank of foldable paperboard, the combination of:

a. opposed pairs of major and minor side walls hingedly interconnected to form a tubular structure open at the top and bottom;

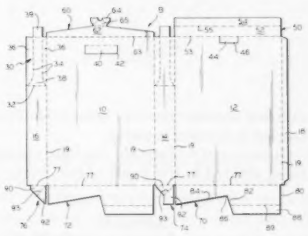
b. at least one of said major side walls including handle means for grasping and carrying the carton;

c. top and bottom closure means for closing the top and bottom of the carton;

d. said bottom closure means including opposed first and second pairs of closure flaps associated with said pairs of major and minor side walls, respectively;

e. said closure flaps of said first pair each including:

i. a flat, unscored, bottom panel hingedly attached at one edge to a lower edge of a related major side wall and presenting in a medial area thereof a recess adapted to interlock with a corresponding recess in the bottom



panel of the other closure flap of said first pair when the carton is in erected condition;

ii. a reinforcing side panel hingedly attached to said bottom panel, at an edge parallel to and opposite from the edge of the bottom panel which is hinged to a major side wall, and disposed to lie against the inner surface of the opposed major side wall when the carton is in an erected condition;

f. said closure flaps of said second pair each including:

i. a first panel section hingedly attached at one edge to a lower edge of a related minor side wall;

ii. a second panel section hingedly attached to said first panel section and in fold-back relation therewith, when said carton is in a collapsed condition;

iii. said second panel section being secured to an adjacent bottom panel and interposed between said first panel section and said bottom panel when the carton is in a collapsed condition.

3,899,125

FLIP TOP CARTON

Richard E. Andrews, Whitestone, N.Y.; John D. Desmond, and Joseph J. Hart, both of Philadelphia, Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed Sept. 5, 1974, Ser. No. 503,381

Int. Cl.² B65D *5/38, 5/66*

U.S. Cl. 229—44 CB **7 Claims**

1. A flip top carton formed from a cut and scored blank of paperboard or the like of the type where a cover member is moved with respect to a carton receptacle from a closed position to an open position, comprising:

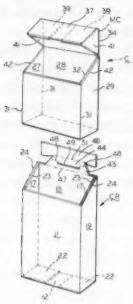
a. an open top carton receptacle having front, back, bottom and side receptacle panels;

b. a cover for said open top carton receptacle having front, back, top and side cover panels in outer telescoping relationship with respect to said open top carton receptacle and movable with respect thereto between an open position and a closed position;

c. means for effecting a connection between said open top receptacle and said cover whereby sliding movement of

said cover with respect to said receptacle will cause said cover to move from open to closed position and vice versa, said means comprising:

i. first, second and third operator members foldably connected to each other and extending from the back receptacle panel of said open top receptacle;



ii. said first operator member being foldably connected to said back receptacle panel;

iii. at least one of said second and third operator members being secured to the inside of said cover.

3,899,126

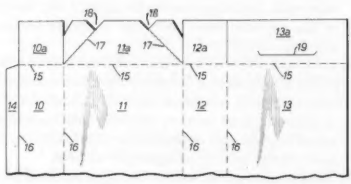
CARTONS AND BLANKS FOR FORMING CARTONS

William Edward Palmer, Bredon, England, assignor to Vibixa Limited, Cheltenham, England

Filed Jan. 23, 1974, Ser. No. 435,684

Int. Cl.[2] B65D *5/54*

U.S. Cl. 229—51 TC **8 Claims**



1. A carton having side walls, respective end flaps attached to each end of each side wall to provide the top and bottom of the carton and a preformed lining sleeve fastened into the carton for protrusion beyond the ends of the side walls thereof, a pair of opposed end flaps at one end of the carton being disposed in face-to-face relation in the closed condition of the carton, the upper of said pair of end flaps being formed with a pair of lines of weakness whereby, to open the carton, a user may effect a separation operation along said lines of weakness, thereby providing a tab for engagement in a slot in the lower end of said pair of end flaps for effecting reclosure of the carton, and the lower of said pair of opposed end flaps extending between and being hingedly connected to a pair of opposed end flaps which are so shaped and have fold lines so arranged that each car. be folded inwardly in such way that a triangular part based on the fold line between the flap and the adjoining side wall of the carton is overlapped by a pair of parts of the flap which are doubled back on a fold line, said lower end flap and the pair of end flaps hingedly connected thereto serving, on closure of the carton, to shape the end of the lining sleeve with a pleat in each side and to fold it over to nip a pleated end extremity of the lining sleeve against the upper end flap at its hinged connection with the adjoining side wall of the carton and wherein the pair of lines of weakness each extend from a corner of the side wall adjoining said upper end flap at an inclination to the line of juncture between the end flap and the side wall, that portion of the end flap between the lines of weakness constituting a tab-defining portion.

3,899,127

ARTICLE FOR POSTAL CONVEYANCE, ESPECIALLY ONE ALLOWING FOR A REPLY

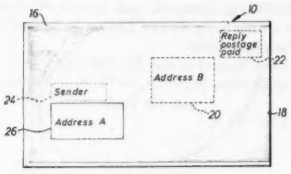
Lars Paul Melander, Kryssarvagen 13, S-183 52 Taby, Sweden

Filed Apr. 15, 1974, Ser. No. 460,701

Claims priority, application Sweden, Apr. 19, 1973, 7305661

Int. Cl. B65d *27/06*

U.S. Cl. 229—73 **14 Claims**



1. A postal article for postal conveyance, especially a so-called "return or reply" article comprising, firstly, a casing or wrapper consisting of a non-transparent base or bottom portion which at least on one side is covered by a transparent cover and, secondly, an insert introduced between the cover and the base portion, substantially covering the latter, wherein

a. a first address or forwarding address is provided on the cover of the casing in the form of a label or by printing;

b. a second or return address is provided inside the casing, hidden by the insert, so that the destination of the postal article is determined by the first address;

c. which addresses are so placed and located in relation to each other that when they appear simultaneously due to the removal of the curtaining effect of the insert, the first address will denote the sender, while the second address will denote the addressee; and

d. a notation is provided inside the casing, the notation being normally hidden by the insert but becoming visible when the curtaining effect of the insert is removed, the notation being so placed in relation to one of the addresses that it appears adjacent said one address for the purpose of indicating the function of said one address when the curtaining effect of the insert is removed.

3,899,128

ZONAL CENTRIFUGE ROTORS

John E. Joyce, Weymouth, Mass., assignor to International Equipment Company, Needham Heights, Mass.

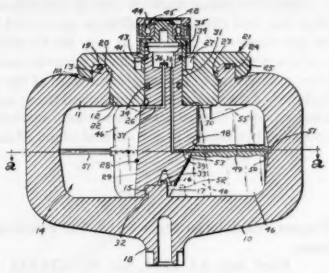
Continuation-in-part of Ser. No. 755,003, Aug. 23, 1968, abandoned. This application Mar. 24, 1970, Ser. No. 22,358

Int. Cl. B04b *1/04, 5/04*

U.S. Cl. 233—32 **16 Claims**

1. A zonal centrifuge rotor including a bowl having a chamber and an integral top wall having an axial port in communication with said chamber and of a diameter substantially smaller than that of the chamber, a cap for said port and detachably secured thereto, and a removable core within said chamber, said core and said bowl including portions detachably interengaged to ensure they rotate together, said core including an axial first part in the form of a hub and a plurality of second parts, each in the form of a fin having upper, lower, inner and outer edges, said inner edges extending into the space directly below the port and at least a part of the other edges abut the inner surfaces of the bowl to establish compartments, means in the bottom of said chamber receiving and slidably holding each second part in a predetermined radial

position, said hub and fins including detachably engaged sets of connecting portions disengageable by upward movement of the hub relative to the fins, said hub and each of said fins



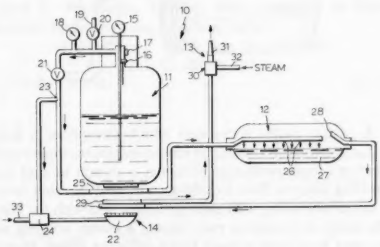
dimensioned for passage through said port, said connecting portions renegageable on downward movement of the hub with the fins in said radial position.

3,899,129

APPARATUS FOR GENERATING ICE NUCLEI SMOKE PARTICLES FOR WEATHER MODIFICATION

Norikiko Fukuta, Seoul, South Korea, and Young H. Paik, Englewood, Colo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Division of Ser. No. 285,995, Sept. 5, 1972, Pat. No. 3,835,059. This application Apr. 16, 1974, Ser. No. 461,339
Int. Cl.[2] A01G *15/00*; **E01H** *13/00*
U.S. Cl. 239—14 **4 Claims**



1. In an apparatus for generating ice-nuclei smoke particles comprising:

means for generating superheated steam,

an enclosed containing means holding therein an ice nuclei compound,

a multi-opening fluid discharge means maintained within said containing means where multi-openings of said discharge means are disposed to direct fluid discharged therefrom at the surface of said compound,

a conduit means connected to an outlet of said generating means and to an inlet of said discharge means whereby said conduit means carries therein said superheated steam from said generator to said discharge means wherefrom steam discharged at said compound surface evaporates compound into said steam,

a converging-diverging nozzle means,

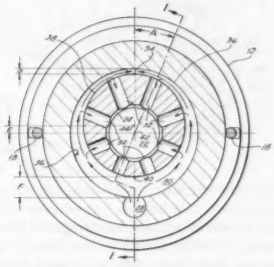
a further conduit means having connections to an outlet of said containing means and to an inlet of said nozzle means and constituting a passage for steam laden with vapors of said compound leaving said containing means and entering said nozzle, wherein said vapor laden steam is quenched substantially by adiabatic and isentropic expansion at supersonic velocities.

3,899,130

ATOMIZER WITH GRADUATED LIQUID FEED AND MANUFACTURING METHOD

Frank S. Bell, Jr., Tuxedo Park, N.Y., assignor to Sonic Development Corporation, Upper Saddle River, N.J.

Filed Feb. 28, 1974, Ser. No. 446,909
Int. Cl.[2] B05B *17/06*
U.S. Cl. 239—102 **10 Claims**



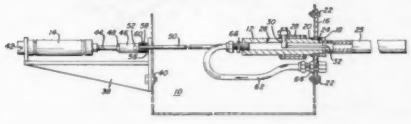
5. A sonic pressure wave-actuated atomizer including a converging-diverging gas nozzle and a cavity resonator opposite the exit of said nozzle, a plurality of feed holes spaced around the perimeter of said nozzle and positioned to deliver a liquid into the gas flowing through the nozzle, liquid inlet conduit means, and manifold means forming a distribution conduit of generally circular configuration interconnecting said feed holes with said inlet conduit, said distribution conduit having a cross-sectional area which decreases at increasing distances from said inlet conduit.

3,899,131

METHOD AND APPARATUS FOR SPRAYING AGGLOMERATING POWDERS

Michael L. Mester, Lower Burrell, and Frank L. Whiteman, Elizabeth Twp., Allegheny County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 23, 1974, Ser. No. 508,495
Int. Cl. B05b *15/02*
U.S. Cl. 239—123 **9 Claims**

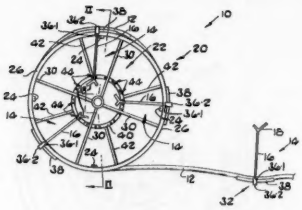


1. An apparatus for pneumatically spraying dry powders through a delivery tube comprising a fluidized bed powder reservoir, a powder chamber housing attached within said reservoir having an elongated chamber therein communicating with said delivery tube and an opening in a wall thereof communicating with the interior of said reservoir through which fluidized powders may be admitted, a valve means for closing said opening, wiper means attached to said valve means for wiping the edges of said opening whenever said valve means is activated to thereby keep said opening clear, means for blowing gas through said powder chamber housing and delivery tube with a low-velocity purging blow when said valve means is in a closed position and with a high-velocity powder spraying blow when said valve means is in the open position.

3,899,132
IRRIGATION APPARATUS

Christian Grobbelaar, 461 Queen's Crescent,, Pretoria, Transvaal Province, South Africa

Filed July 10, 1974, Ser. No. 487,021
Int. Cl.² B65H 75/34
U.S. Cl. 239—199 10 Claims

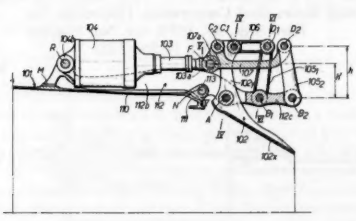


1. Storage means for storing an elongated flexible irrigation conduit having sprinkler means in the form of sprinkler pipes with nozzles at their free ends, at spaced intervals along it length, and comprising a storage reel having a peripheral zone for receiving the conduit in a rolled up condition, having an internal receiving zone for receiving the sprinkler means extending radially inwardly from the conduit when rolled up on the reel, and having locating means within the receiving zone for locating the sprinkler means in position therein.

3,899,133
NOZZLES HAVING A VARIABLE CROSS-SECTION

Andre Alphonse Mederic Leon Camboulives, Savigny-sur-Orge; Theophile Francois Le Maout, Cesson, and Bernard Arthur Zibette, Vitry-sur-Seine, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation de France, France

Filed Sept. 17, 1974, Ser. No. 506,869
Claims priority, application France, Sept. 21, 1973, 73/33962
Int. Cl.² B64C 15/06
U.S. Cl. 239—265.39 5 Claims

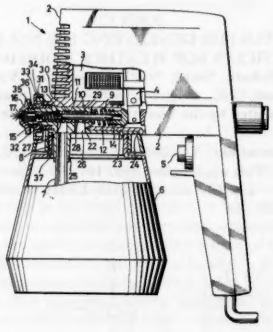


1. In a variable-section nozzle of the type comprising a fixed structure embodying a fixed nozzle casing; a plurality of controlled flaps distributed around and in extension of the downstream portion of said fixed nozzle casing, each of which flaps extends to either side of a central plane containing the longitudinal axis of the nozzle, and is articulated about a first geometric axis disposed substantially tangential in relation to the nozzle, to said fixed structure; a plurality of intermediate levers disposed in alternation with said controlled flaps, each articulated, about a second geometric axis substantially tangential in relation to the nozzle, to said fixed structure; a plurality of connecting links each of which is articulated on the one hand about a third geometric axis substantially tangential in relation to the nozzle, to a controlled flap, and, on the other hand, about a fourth geometric axis substantially tangential in relation to the nozzle, to an intermediate lever adjacent said flap in order that each control flap is respectively attached to two successive intermediate levers, the assembly formed by said controlled flaps, said intermediate levers and said connecting links, constituting a kinematic chain which is closed around the nozzle; and a plurality of mobile control elements each of which corresponds with a controlled flap and makes it possible to pivot said flap about said first geometric axis in order to vary the transverse cross-section of the nozzle, the improvement wherein each intermediate lever extends up to the neighbourhood of the respective central planes of two successive controlled flaps; and wherein for each controlled flap, the two associated connecting links are disposed substantially in the central plane of said flap.

3,899,134
SPRAY GUN

Josef Wagner, Markdorfer Strasse 185, 799 Friedrichshafen 2, Germany

Filed June 13, 1974, Ser. No. 478,856
Claims priority, application Germany, July 20, 1973, 2337039
Int. Cl.² B05B 9/043
U.S. Cl. 239—332 10 Claims

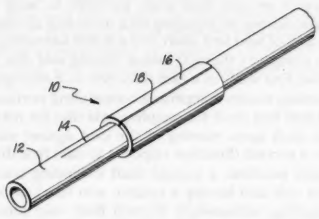


1. A piston pump spray gun which comprises a housing having a depending handle, an electromagnetic motor with an oscillating armature in said housing, a switch in said handle controlling current flow to said motor, said housing having a bore communicating with said armature and with the front of the housing, a one-piece part having a pump housing sleeve fitting said bore with a hard metal cylinder sleeve therein, a piston slidable in said cylinder sleeve, a spring in said bore of the gun housing biasing said piston against said oscillating armature of said motor, an outlet valve in said pump housing sleeve portion bottomed against said cylinder sleeve, a spray nozzle on the outer end of said pump housing sleeve receiving fluid from said outlet valve, a locking ring rotatable on said pump housing sleeve threaded in said gun housing bore against said pump housing sleeve for securing the sleeve in the bore, said sleeve having a depending neck and a container cover suspended on said neck, said gun housing having a recess receiving said neck and a bottom wall receiving said cover, a removable liquids container suspended from said cover, said neck and cover having passages therethrough connecting the interior of the container with the interior of said cylinder sleeve, a suction tube extending from one of said passages to the bottom of said container and a collection chamber in said cylinder sleeve communicating with the other of said passages whereby said spring and said armature will reciprocate said piston to suck liquid from said container through said tube into said cylinder sleeve and will discharge the liquid in the sleeve past said outlet valve to said spray nozzle and said part is easily mounted in and removed from the bore and recess of said gun housing by manipulation of said locking ring.

3,899,135
WATER EMITTER

Edward D. O'Brian, 1695 Crescent Ave., Anaheim, Calif. 92801

Filed Sept. 24, 1973, Ser. No. 400,019
Int. Cl. A01g 27/00
U.S. Cl. 239—534 6 Claims



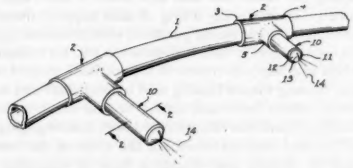
1. A water emitter having an elongated, resilient, imporous tube, the tube having a slit extending along the length thereof, the resiliency of the tube permitting the slit to open in response to internal pressure within the tube and automatically closing off the slit upon the cessation of such internal pressure in which the improvement comprises:

a sleeve located around the tube adjacent to the slit, said sleeve being moveable on the tube and fitting closely around the tube so as to be capable of being moved to a position relative to said slit to control the amount that said slit will open in response to internal pressure.

3,899,136
EMITTER FOR IRRIGATION SYSTEMS

Richard C. Harmony, Tucson, Ariz., assignor to Harmony Emitter Company, Inc., Tucson, Ariz.

Filed Apr. 1, 1974, Ser. No. 456,617
Int. Cl. B05b 1/32
U.S. Cl. 239—534 10 Claims



1. An emitter having a water discharge outlet and connected to a source of water under pressure for irrigating soil, said emitter comprising:

a. a pair of imperforate flexible sheets coterminous with one another and defining both the water discharge passageway for a flow of water through said emitter and the water discharge outlet of said emitter, said passageway extending from the pressurized water source to the discharge outlet of said emitter;

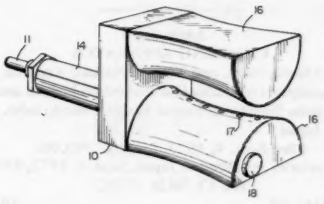
b. transverse rib means disposed within the central part of adjacent surfaces of each of said pair of flexible sheets for establishing a water pressure gradient through said passageway;

c. pressure means for biasing said pair of sheets toward one another to regulate the lateral expansion of said passageway, said pressure means being responsive to the water pressure at the source and variable in proportion to the water pressure at the source; whereby, the flow of water through said emitter is regulated at a constant rate by said rib means and said pressure means despite variations in the water pressure at the source.

3,899,137
CLEANING DEVICE FOR PHOTO-SLIDES

Martin Shenker, 7700 Cindy Ln., Bethesda, Md. 20034

Filed Dec. 17, 1974, Ser. No. 533,636
Int. Cl.[2] B05B 1/26, 1/20; F26B 13/02; B08B 5/02
U.S. Cl. 239—545 6 Claims

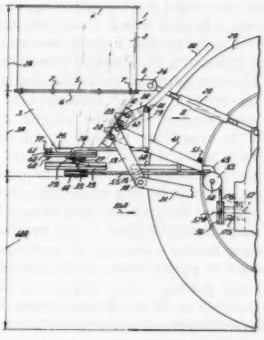


1. A device for cleaning dust from a miniaturized flat article comprising two allochirally shaped and juxtaposed members providing a space therebetween for insertion of the work piece, said members having a compound curvature of semi-circular cross-section with opposed surfaces that are concave, with each said face having openings for providing opposed air jets.

3,899,138
SPREADING IMPLEMENTS

Ary van der Lely, 10, Weverskade, Maasland, and Cornelis Johannes Gerardus Bom, 36, Esdoornlaan, Rozenburg, both of Netherlands

Filed Jan. 7, 1970, Ser. No. 1,199
Claims priority, application Netherlands, Jan. 17, 1969, 6900782; Jan. 17, 1969, 6900783
Int. Cl. A01c 19/00
U.S. Cl. 239—661 6 Claims



1. A spreading implement comprising a hopper with supporting frame parts and at least one rotatable spreading member mounted beneath an outlet in said hopper, said hopper having an upper part and a lower part detachably connected to each other, said upper part having coupling means with which the implement is connectable to an upper arm of a three-point lifting device of a tractor, said rotatable spreading member being mounted on a vertical shaft rotatably and entirely supported in said lower part with a dosing mechanism positioned between said hopper and said spreading member, at least two supporting members being detachably connected to said lower part to connect the implement to the lower arms of a three-point lifting device of a tractor, a transmission for driving said spreading member, said transmission including connecting means to connect the transmission to the power take-off of a tractor, and comprising flexible endless means

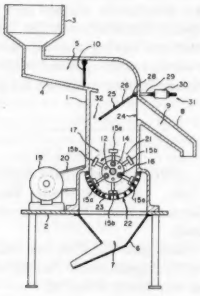
connecting said spreading member to said connecting means and the power take-off, said connecting means comprising guide means for said flexible endless means and being supported by said hopper on frame members detachably connected to said lower part of said hopper whereby said hopper parts and said frame members can be separated and the implement conveniently stored.

3,899,139

CRUSHING APPARATUS

Nobuhiko Okada, Nara, and Teruaki Suzuki, Kadoma, both of Japan, assignors to Osaka Gas Kabushiki Kaisha and Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho, both of Osaka, Japan

Filed Sept. 4, 1973, Ser. No. 393,902
Claims priority, application Japan, Sept. 4, 1972, 47-88991
Int. Cl. B02c *13/282*
U.S. Cl. 241—68 **10 Claims**



1. A crushing apparatus for an admixture of materials which are crushable by impact force comprising, in combination: a housing having a hopper which communicates with a throat means for feeding the mixture into the interior of said housing; an outlet for exhausting the crushed materials from the interior of said housing; a conduit for exhausting secondary materials from the interior of said housing, said conduit being located to communicate with the interior of said housing beneath and in opposition to said throat means; crushing means having a terminal extent rotatable on a substantially horizontal first axis located within said housing between said outlet and said conduit; driving means for rotating said crushing means; selection means positioned adjacent to the path of rotation of said terminal extent of said crushing means, said selection means having a plurality of openings of a predetermined diameter to permit entry of the material crushed into said outlet; and guiding means supported on said housing above said conduit to direct floatable material toward said conduit while simultaneously serving to deflect heavy material back toward said crushing means.

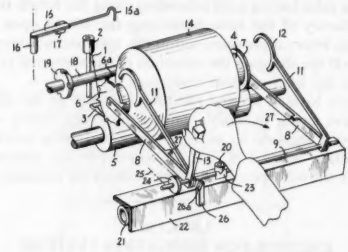
3,899,140

TEXTILE MACHINE WITH DEVICE FOR FORMING A YARN RESERVE ON A BOBBIN TUBE DURING THE WINDING OPERATION AND A YARN TENSION SENSOR COOPERATING WITH THE DEVICE

Jean Gleyze, St. Pierre de Colombier, France, assignor to Societe Civile Textile dite Socitex, Lyon, France

Continuation-in-part of Ser. No. 471,974, May 21, 1974. This application June 24, 1974, Ser. No. 482,288
Claims priority, application France, June 25, 1973, 73.23177; Feb. 28, 1974, 74.06962
Int. Cl. B65h *54/34*
U.S. Cl. 242—18 PW **11 Claims**

1. In a textile machine, a combination, including a device for forming a yarn reserve at one end of a bobbin tube and comprising support means supporting a bobbin tube rotatable about its axis and tiltable about a pivot axis substantially parallel to the bobbin tube axis between a winding position and a release position; drive means cooperating with said bobbin tube for rotating the same, when in said winding position, about its axis; a first shaft substantially parallel to said pivot axis and rotated at a substantially slower speed than said bobbin tube is rotated by the drive means; a disc freely turnable mounted on said first shaft movable in axial direction thereof and having an engaging face including an obtuse angle with the axis of said first shaft and a notch extending inwardly from the periphery thereof; means biasing said disc along the axis of said first shaft in a first direction to a disengaged position; coupling means comprising cooperating portions on said disc and said first shaft for coupling said disc for rotation with said first shaft upon moving of the disc against said biasing means in a second direction opposite to said first direction to an engaged position; a second shaft extending transverse to said pivot axis and having a reserve arm fixed at one end to and projecting substantially normal from said second shaft, said second shaft and said arm thereon being turnable between a rest position and a turned position, said arm having at



the free end thereof a hooked yarn guide adapted to engage a yarn during turning of said arm from said turned to said rest position for winding the yarn on one end of said bobbin tube and to form a yarn reserve thereon; transmission means between said bobbin tube support means and said second shaft for turning the latter and said arm thereon from said rest to said turn position during tilting of said support means from said winding to said release position; yieldable locking means for locking said arm in said turn position and for releasing said arm when said support means is moved back to said winding position; biasing means biasing said second shaft and said arm thereon to return from said turned to said rest position after said locking means has released said arm; and engaging means carried by said arm intermediate the ends of the latter and arranged to engage said engaging face of said disc during movement of said arm from said turned to said rest position to move said disc to said engaged position so that the disc is rotated to thereby move said arm in a direction toward its turned position until said engaging means passes through said notch in said disc, whereby successive portions of said yarn reserve are wound in opposite directions and cover each other.

3,899,141

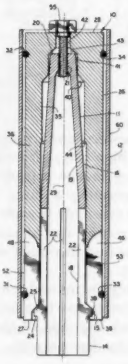
SPINDLE ADAPTER

John Padgett, Jr., 102 W. May St., Calhoun, Ga. 30701

Filed Mar. 11, 1974, Ser. No. 449,860
Int. Cl. B65h *75/30, 79/00*
U.S. Cl. 242—46.4 **5 Claims**

1. A spindle adapter for converting a spindle for rotating cone-shaped spools to a spindle for rotating cylindrically shaped spools, said adapter being approximately cylindrically shaped about its exterior surface with a lower end and an upper end and with its exterior surface defining an external approximately annular groove adjacent each end, an O-ring positioned in each annular groove, an approximately circular

passage extending longitudinally through said adapter from said lower end to said upper end so that the adapter has an approximately annular side wall, said passage including an approximately cylindrical large diameter flange at said lower end and then converging inwardly to a first sloped annular shoulder of smaller diameter than said flange as the passage extends away from said lower end of the adapter, said passage extending toward the upper end of said adapter and converging inwardly to a second sloped annular shoulder of smaller diameter than said first sloped shoulder and then forming an approximately cylindrical bore adjacent said upper end, and said passage terminating in an aperture of smaller diameter than said bore, said aperture intersecting said bore and the



upper end of said adapter, said flange, said first and second sloped annular shoulders, said bore and said aperture being concentric with the longitudinal centerline of said adapter, and a plurality of slots formed through the side wall of said adapter and extending from the lower end of said adapter axially toward the upper end of said adapter beyond said flange, said first sloped annular shoulder and the external annular groove adjacent said lower end and its O-ring, said slots being circumferentially spaced about said adapter whereby tines are formed in said side wall at the lower end of said adapter with the O-ring in the external annular groove adjacent the lower end of said adapter extending across said slots and tines.

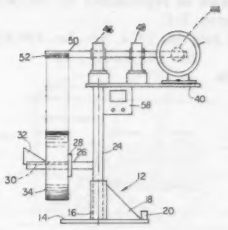
3,899,142

ROLL TIGHTENER

James T. Hodges, Jr., Tallmadge; John B. Braddock, Cuyahoga Falls, and George C. Dishman, Stow, all of Ohio, assignors to Sonoco Products Company, Hartsville, S.C.

Filed Aug. 27, 1973, Ser. No. 391,726
Int. Cl.[2] B65H *23/06, 77/00*
U.S. Cl. 242—67.1 R **3 Claims**

1. Apparatus for tightening the convolutions of a loosely wound roll of web material comprising, a base member, frame means extending vertically from said base member, a stationary roll support shaft fixed on and extending horizontally from, one side of said frame means for supporting said loosely wound roll, means for securing said roll to said support shaft in a nonrotatable manner, a rotatable tightening shaft having a web-receiving slot therein mounted above said roll support shaft, electrical motor means mounted on said frame means



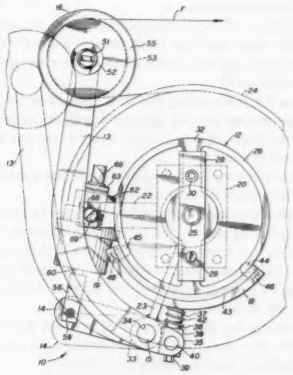
on the side opposite said support shaft, said motor means being in driving engagement with said tightening shaft.

3,899,143

TENSION CONTROL DEVICE

Raymond J. Slezak, 558 Princeton St., Barberton, Ohio 44203

Filed Jan. 10, 1974, Ser. No. 432,133
Int. Cl. B65h *59/38*
U.S. Cl. 242—156.2 **6 Claims**

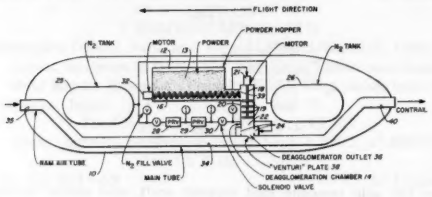


1. A tension control device for spooled filamentary material comprising: a support structure, means rotatably supporting a spool in said support structure, means having a friction brake surface associated with said means rotatably supporting a spool, a shaft journaled in said support structure, a first lever fixed on said shaft, filament guide means mounted on one end of said first lever for engaging the filamentary material payed out from said spool, brake means mounted on the other end of said first lever for engagement with said brake surface, means for resiliently biasing said brake means against said brake surface interposed between said brake means and said first lever, a second lever fixed on said shaft, and an air cylinder having a fixedly mounted portion and a portion connected to said second lever for loading of said first lever in order to balance the force acting on said first lever, exerted by the filamentary material against the filament guide means, and the friction between the brake means and brake surface and to maintain a selected tension in said filament.

3,899,144
POWDER CONTRAIL GENERATION

Donald K. Werle, Hillside; Romas Kasparas, Riverside, and Sidney Katz, Chicago, all of Ill., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 22, 1974, Ser. No. 490,610
Int. Cl.[2] B64D 1/16
U.S. Cl. 244—136 **12 Claims**



1. Contrail generation apparatus for producing a powder contrail having maximum radiation scattering ability for a given weight material, comprising:

a. an aerodynamic housing;

b. a jet tube means passing through said housing, said tube means having an inlet at a forward end of said housing and an exhaust at a rearward end thereof;

c. a powder storage means in said housing;

d. a deagglomeration means also in said housing;

e. means connecting said powder storage means with said deagglomeration means for feeding radiation scattering powder from said powder storage means to said deagglomeration means;

f. the output of said deagglomeration means dispensing directly into said jet tube means for exhausting deagglomerated powder particles into the atmosphere to form a contrail; and

h. means for controlling the flow of said powder from said storage means to said deagglomeration means.

9. The method of producing a light radiation scattering contrail, comprising:

a. surface treating light scattering powder particles to minimize interparticle cohesive forces;

b. deagglomerating said powder particles in two stages prior to dispensing into a jet tube by subjecting said powder particles to a hammering action in the first stage to aerate and precondition the powder, and by passing said powder through a jet mill in the second stage to further deagglomerate the powder;

c. dispensing the deagglomerated powder from the jet mill directly into a jet tube for exhausting said powder into the atmosphere, thus forming a contrail.

3,899,145
LASER TRANSMITTING AND RECEIVING LENS OPTICS

Andrew N. Stephenson, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 20, 1973, Ser. No. 381,193
Int. Cl. F42b 15/02
U.S. Cl. 244—3.13 **7 Claims**

1. A single optical lens system for both transmitting and receiving laser and other type parallel light beams comprising:

a. a convex meniscus lens element and a concave mirror forming a Bouwers lens arrangement;

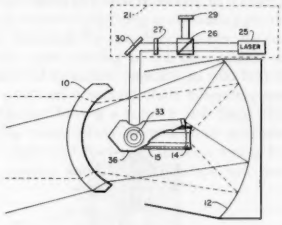
b. a negative lens element immediately ahead of the focal surface of said Bouwers lens assembly, forming a Galilean concentric Bouwers lens assembly;

c. said negative element being used to afocalize an incoming converging laser beam so that the Bouwers lens arrangement collimates and directs the laser beam entering the system via said convex lens element and concave mirror to the concentric point of the Bouwers lens arrangement;

d. a single mirror surface at said concentric point of the Bouwers lens arrangement for directing said incoming laser beam to one side of the lens assembly;

e. a laser beam entering said lens system from said one side of said assembly being directed by said concentric point mirror surface to the negative element which then acts as an expanding element for directing the laser beam to said concave mirror where it is reflected to said convex lens element and passed therethrough to emerge therefrom as a parallel light beam;

f. said lenses and mirrors assembly and the relationship thereof being mounted for operating to scan the focal



surface of the Bouwers lens arrangement at high angular acceleration and high rates of motion;

g. a laser generating means at said one side of the lens assembly for generating a laser beam to be directed through said lens assembly toward a target;

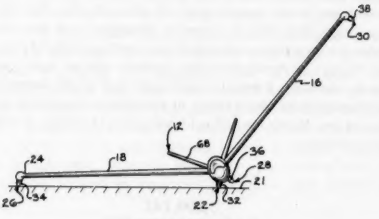
h. a laser detector means also at said one side of the lens assembly for detecting incoming and reflected laser signals from a target;

i. said laser generating means and said laser detecting means employing a common aperture and a common polarization means at said one side of the lens system to both transmit and receive laser signals.

3,899,146
WIND-LAUNCHED SAILPLANE

James L. Amick, 1464 Cedar Bend Dr., Ann Arbor, Mich. 48105

Filed Mar. 27, 1974, Ser. No. 455,043
Int. Cl. B64c 31/02
U.S. Cl. 244—16 **6 Claims**



1. A sailplane comprising a fuselage with wings mounted thereon, said wings having a dihedral angle within the range of 15° to 45°, running gear means connected to said fuselage, and other running gear means connected adjacent to the tips of said wings so that one of said wings can assume a horizontal attitude for support of the sailplane on a flat surface on the running gear means of said one wing and said fuselage and the other wing will then extend upward at an angle to the horizontal within the range of 30° to 90° to function as a sail for movement of the sailplane on said flat surface, said fuselage and wing tip running gear means being rotatable about generally vertical axes for steering purposes when the running gear

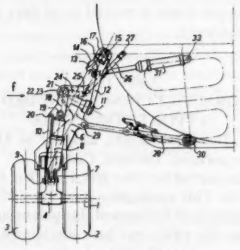
means are supported on said flat surface, and steering gear means are connected to the running gear means for rotating said fuselage and wing tip running gear means in unison for setting the yaw angle of the sailplane when in motion on said flat surface.

3,899,147

TRAILING-WHEEL UNDERCARRIAGE TRAIN

Jean Masclet, Paris, and Andre Turiot, Morsang S/Orge, both of France, assignors to Messier-Hispano, Paris, France

Filed Mar. 1, 1974, Ser. No. 447,245
Claims priority, application France, Mar. 5, 1973, 73.07790
Int. Cl.² B64C *25/12*
U.S. Cl. 244—102 R **9 Claims**



1. A trailing-wheel undercarriage train for an aircraft including a fuselage, comprising: two laterally retractable undercarriages, pivotally mounted symmetrically on either side of the fuselage, each including a rigid leg casing on which a pivot arm is pivotally mounted; said arm carrying at least one wheel with which it constitutes an assembly, and also carrying a lower pivot of a damper disposed rearwardly of said casing, and whose upper end is pivotally connected to a lever which is pivotable during the undercarriage-train lifting movement, relative to said casing; said lever being connected, on the one hand, to a strut assembly directly pivoted on the aircraft and, on the other hand, to said arm by way of a telescopic strut which, upon landing and taxying of the aircraft, is reduced in length by the reaction of the ground, without opposing any resistance, but which, during said lifting movement of the undercarriage train, under the action of an operating jack, causes retracting of said arm - wheel assembly along said casing, thereby compressing said damper.

3,899,148

ANTENNA MOUNTING BRACKET FOR A TRUCK CAB

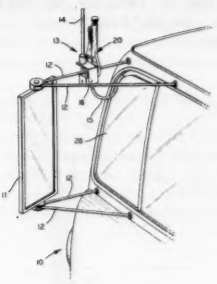
Alva H. Fleming, 5844 Adelaide Dr., Toledo, Ohio 43613

Filed Sept. 6, 1974, Ser. No. 503,670
Int. Cl.² H01Q *1/32*
U.S. Cl. 248—43 **2 Claims**

1. An antenna mounting bracket for a highway vehicle having a support rod attached to the exterior of the vehicle, said bracket consisting of

an adjustable two-part clamp adapted to be removably tightened on said support rod and adjustable to tightly close the jaws thereof on such rods of varying sizes and cross sections,

an antenna support element having at least two legs and being integrally connected to one jaw of said clamp, and a pad lock having a case and a generally U-shaped hasp defining a loop surrounding said rod when closed and aligned with the gripping portions of said jaws, said pad lock being openable for removal from said rods, one part



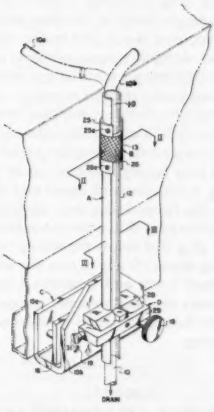
of said lock being integrally connected to one arm of said support element.

3,899,149

BED DRAINAGE TUBE HOLDER

William H. Schneider, 3217 Mt. Troy Rd., Pittsburgh, Pa. 15212

Filed July 12, 1974, Ser. No. 487,858
Int. Cl.² A61G *7/06*
U.S. Cl. 248—75 **19 Claims**

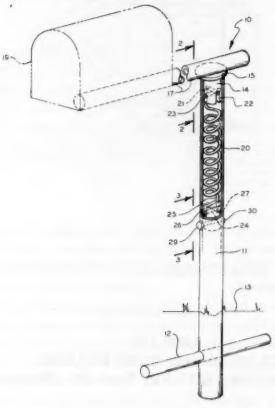


1. In a bedside holder for a length of flexible tubing that is to be positioned to extend from an upper side of a mattress downwardly therefrom past a side rail of a bed frame to empty into an under-positioned receptacle, a longitudinally extending support arm having a channel portion therealong that is open along one side and at opposite end portions thereof to removably sidewise-receive an upper portion of a length of flexible tubing therein, ring-like retention means rotatably carried on said arm for alternately exposing and closing-off at least a portion of the open side of said channel portion to enable a sidewise insertion of the tubing therewithin and a subsequent retention of it in a through-extending relation therealong, and rail clamping means carried by said arm for removably securing it to the side rail of the bed frame.

3,899,150
SELF-RIGHTING MAILBOX SUPPORT

Herschel J. Racquet, R.D. No. 2, Box 328E, Center Rd., Canastota, N.Y. 13032

Filed Oct. 15, 1974, Ser. No. 514,595
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—145 **1 Claim**



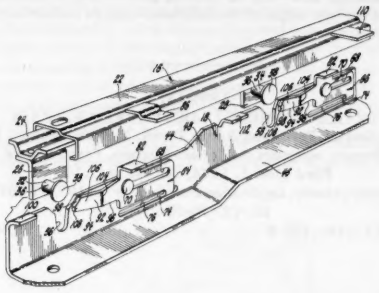
1. A mailbox support comprising a tubular upright member adapted to have one end secured in the ground alongside a roadway, a capped plug rotatably contained on the open upper end of the upright member, an elongated horizontally-disposed member secured at one end to the capped plug and having its other end normally positioned close to the roadway and adapted to be supportingly secured to a mailbox, a helical coil spring contained in the upright member, an anchor plug contained in the upright member, the plug being secured to the upright member by bolt means therethrough, each end of the spring being at least partially bent to extend radially of the spring, the capped plug having a slot across its lower end, the anchor plug having a slot across its upper end, the spring bent upper end lying in the capped plug slot, the spring bent lower and lying in the anchor plug slot, a pin extending diametrically across the capped plug slot below the spring bent upper end, and a pin extending diametrically across the anchor plug slot above the spring bent lower end, whereby when the mailbox end of the horizontally disposed member is struck by a vehicle it swings away from the roadway and is returned to its normal position by the spring.

3,899,151
VEHICLE SEAT ATTACHMENT DEVICE

Peter M. Kobrehel, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1974, Ser. No. 523,219
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—429 **3 Claims**

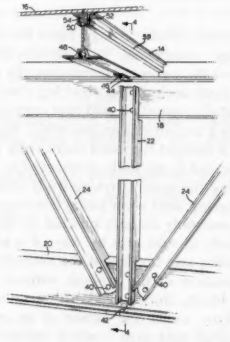
1. In a motor vehicle having a floor pan, a vehicle seat, and a seat adjuster having upper and lower slidably interengaged tracks to permit fore and aft movement of the seat, the improvement comprising: a mounting bracket attached to the floor pan and having an upwardly opening slot therein, a member on the lower track of the seat adjuster being receivable in the upwardly opening slot of the mounting bracket, a slide lock member slidably mounted on the mounting bracket for movement between a latched position in which the slide lock member captures the member of the lower track in the upwardly opening slot and an unlatched position in which the slide lock is moved away from the upwardly opening slot, and driving means on the upper track engageable with the slide lock member to move the slide lock member to latched position when the upper track is moved to its fully adjusted position on the lower track.



3,899,152
CONCRETE FORM INCLUDING EXTRUDED ALUMINUM SUPPORT STRUCTURE

Peter J. Avery, Toronto, Canada, assignor to Aluma Building Systems Incorporated, Toronto, Canada

Continuation-in-part of Ser. No. 204,132, Dec. 12, 1971, Pat. No. 3,787,020. This application Jan. 18, 1974, Ser. No. 434,827. The portion of the term of this patent subsequent to Jan. 22, 1991, has been disclaimed.
Int. Cl. F04g *11/50*
U.S. Cl. 249—18 **5 Claims**



1. For use in the construction of buildings, a concrete forming structure having a concrete forming panel comprising a plurality of substantially planar sheets of material secured to a plurality of beams, each of which is formed of extruded aluminum and has base, web and upper portions;

said base portion of each said beam having a pair of laterally extending flanges and a centrally located, generally T-shaped slot formed longitudinally therein, and having substantially parallel side walls said slot having upper and lower sections where the width of said upper section is greater than the width of said lower section;

said web portion of each said beam being formed between said upper portion and said base portion substantially along the entire length of said beam so as to be able to transfer load forces from said upper portion to said base portion at any place along the length of said beam;

said upper portion of each said beam being in the form of an inverted top hat portion which is open upwardly and being defined by a horizontally extending bottom, a pair of substantially parallel side walls extending vertically

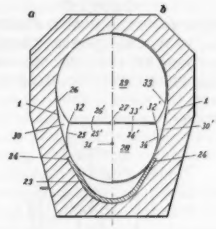
upwardly from said bottom, and a flange extending horizontally outwardly at the top of each said side wall;
where the width and height of said inverted top hat portion of said beam are each substantially greater than the width and height of the upper section of said generally T-shaped slot;
and the width of each laterally extending flange of said base portion is substantially greater than the width of each of the flanges of said inverted top hat portion;
and an independent beam stiffening joist member of substantially rectangular cross-section with a crosswise dimension substantially equal to the average crosswise dimension between said side walls of said upper, inverted top hat portion of said beam being secured in said upper section of each of said beams by means projecting inwardly from at least one of said side walls in each respective upper section and forced into said beam stiffening joist member so as to preclude upward movement therefrom, and so as to increase the deflection resistance of each of said beams;
said planar sheets being secured to said beams by driveable fastening means driven through said sheets and into said independent beam stiffening joist members;
said beams being further secured by bolts having heads in said generally T-shaped slots of said beams to additional structural members so that said concrete forming structure can be moved as an integral unit.

3,899,153

HOLLOW INFLATABLE FORMWORK ELEMENTS FOR PRODUCING CONCRETE STRUCTURES

Franz Friedl, Vienna, Austria, assignor to Semperit Aktiengesellschaft, Austria

Filed Jan. 15, 1973, Ser. No. 323,355
Claims priority, application Austria, Jan. 13, 1972, 253/72
Int. Cl.[2] B28B *7/32*
U.S. Cl. 249—65 **3 Claims**



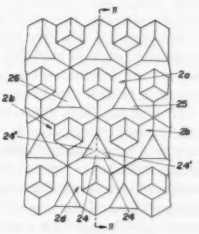
1. A re-usable hollow formwork element, for use in concrete pipe casting and operable to be rendered pressure resistant by filling it with a fluid medium,
comprising in combination,
an elongated, inflatable flexible closed outer casing of predetermined shape when inflated,
at least two elongated adjacent superposed closed hollow flexible bodies positioned along a substantially vertical axis whereby one hollow flexible body is positioned lower than all other hollow flexible bodies, within, and extending over the entire length of, said outer casing, whereby an elongated closed cavity is formed intermediate said outer casing and said bodies, said bodies as well as said cavity being operative to be pressurized by said fluid medium,
each of said hollow bodies having at least one portion facing the respective portion of the adjoining body, and each defining an opening in said portion, the adjoining bodies intercommunicating interiorly through said openings,
a first valve connected to one body operable for introducing said fluid medium thereinto for pressurizing thereby both said bodies to inflate them,
a second valve connected to said outer casing adjacent said elongated cavity, operable for introducing said fluid medium into said elongated cavity for pressurizing thereby said cavity, whereby the outer casing will be inflated to its predetermined shape, and
support means operable for supporting the casing when inflated where the lower of said bodies touches said casing, said support means stopping short of said elongated cavity and
including a gutter-like bottom plate having two ends at an angle to each other,
a part of said casing adjacent said one hollow flexible body being disposed above said bottom plate and when inflated having an external arcuate surface touching tangentially said ends of said bottom plate when inflated, whereby said inflated casing will be supported substantially only by said ends.

3,899,154

LIGHT REFLECTOR MOLD

Morimasa Tanaka, Kanagawa, Japan, assignor to Ichiko Industries Limited, Tokyo, Japan

Division of Ser. No. 404,756, Oct. 9, 1973. This application July 19, 1974, Ser. No. 490,029
Claims priority, application Japan, Sept. 5, 1970, 45-78059
Int. Cl. B29c *1/00;* **B29d** *11/00*
U.S. Cl. 249—117 **2 Claims**

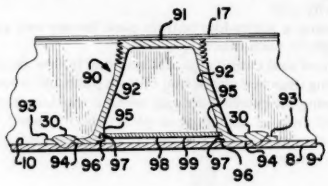


1. A mold for shaping a light reflector, comprising:
a. a plurality of central pins each having a regular hexagonal cross-section and having on one end three square flat planes joined with each other at right angles to form an apex projecting toward the outside of the mold, and,
b. a further plurality of adjacent pins each having a regular hexagonal cross-section and having, on one end, two planes at right angles to each other on the opposite sides of a common edge, said common edge being inclined with one end of said common edge projecting toward the outer side of the mold relative to the longitudinal axis of said adjacent pin at an angle the same as that of any two of the three square flat planes on said one end of the central pin relative to the longitudinal axis of the central pin, and also having, at said one end of the adjacent pin, a plane crossing said common edge line,
c. each of said central pins being surrounded by six of said adjacent pins with each of the three flat planes of the central pin meeting at its two outer edge lines two flat planes of two of the surrounding adjacent pins at right angles.

3,899,155
CONCRETE FORM PANELS WITH HOLLOW REINFORCING RIBS

Edward B. Ward, 824 Winchester, Kansas City, Mo. 64125

Filed Oct. 23, 1973, Ser. No. 408,440
Int. Cl.[2] E04G 9/06
U.S. Cl. 249—189 3 Claims



1. A panel for forming a concrete wall comprising:

a. a plate having a pair of opposed planar side faces, said plate having opposed side edges and opposed end edges with the end edges substantially transverse to said side edges, one of said opposed side faces presenting a planar surface for forming one surface of a concrete wall;

b. said plate having side strips adjacent to and spaced from a respective side edge forming side flanges, said side strips extending from and being substantially normal to the other opposed side face and having opposite ends adjacent said end edges;

c. said plate having end strips adjacent to respective end edges, said end strips extending from and being substantially normal to said other opposed side face and having opposite ends adjacent respective ends of said side strips;

d. a plurality of hollow reinforcing ribs secured to the other opposed side face, said hollow ribs being generally channel shaped with a web and side legs extending from opposite longitudinal edges thereof terminating in outwardly extending flanges having free edges spaced from a respective leg and having surfaces which lie on portions of said other opposed side face, and gun welds securing said rib flanges to said plate with portions of the engaging flange surfaces and other opposed side face joined together, said flanges being greater in width than the width of the gun welds, said welds being positioned generally centrally between a leg and said flange free edge;

e. a plurality of said ribs extending transversely of the longitudinal dimension of said plate in spaced apart parallel relation with said ribs having opposite ends abutting said side strips and being secured thereto;

f. the gun welds securing said rib flanges to the plate being in mutually spaced apart relation in lines extending both transversely and longitudinally of said plate and characterized by an absence of warpage in said plate and disfigurement of said one opposed side face;

g. said rib legs having inwardly facing longitudinal grooves therein adjacent said other opposed side face, an elongate flat strip member positioned in the interior of said ribs and having opposed side edges seated in said grooves, said flat strip members extending the length of the respective rib for preventing entry of foreign material into a major portion of the space defined by said ribs and said plate.

3,899,156
SINGLE BLADE FIRE DAMPER

Francis J. McCabe, Apt. A-4, North & East Sts., Doylestown, Pa. 18901

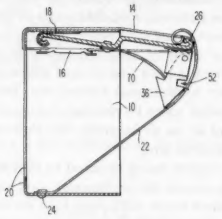
Filed Jan. 23, 1974, Ser. No. 435,762
Int. Cl.[2] F16K 17/38; E05C 3/00
U.S. Cl. 251—303 5 Claims

1. A fire damper, comprising:

a. a frame, said frame defining a flow passage therethrough and having a flange thereon inwardly depending from the walls thereof;

b. a blade mounted within said frame to articulate about one edge of said blade so as to be movable between open and closed positions with respect to said frame;

c. spring means mounted to said frame and engaging the free swinging portion of said blade to exert a force thereon to move said blade from said open to said closed position;

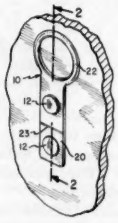


d. lock means for securely engaging the frame and the blade in the closed position to retain the blade in that position, said lock means comprising a pivotally mounted latch member and a spring, said latch member having a free end with a beveled surface thereon and having a slot defined therein, said beveled surface positioned to engage the inwardly depending flange of the frame on movement of said blade from an open position to a closed position, continued movement thereof to cam said latch about its pivot to allow said slot to matably engage said flange in the closed position, thereby producing positive retention of the blade in the closed position.

3,899,157
TACK FASTENER AND STRIPPER

Robert Thomas, 30 W. Chicago Ave., Chicago, Ill. 60610

Filed June 17, 1974, Ser. No. 480,048
Int. Cl.[2] B25C 11/00; B66F 15/00
U.S. Cl. 254—18 1 Claim



1. A tack and tape remover for lifting a conventional tack, having a head, or adhesive tape from a surface to which it has been affixed comprising:

a flat elongated strip with a distal end having an aperture with a diameter less than the diameter of said head, and a proximal end, and

a rigid integrally formed ring, connected to said strip at said proximal end, normally coplanar with said strip and of thickness substantially equal to or less than the combined thickness of said strip and said tack head,

said ring being large enough to be manually grasped by inserting a human adult finger therethrough and said strip being made of a flexible substantially inelastic material so that said ring, when grasped, is movable from said normal position coplanar with said strip to a position substantially

transverse to the plane of said strip for pulling said tack or tape in a direction substantially normal to said surface.

3,899,158

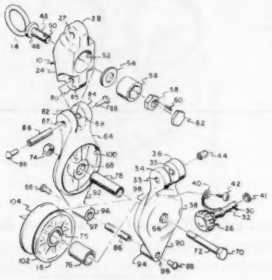
HANDLINE SNATCH BLOCK

Gordon W. Johnson, 6163 N.E. 185th, Seattle, Wash. 98007

Filed Sept. 25, 1973, Ser. No. 400,638

Int. Cl.[2] B66D *3/02*

U.S. Cl. 254—194 **1 Claim**



1. A handline snatch block having many components made of fiberglass and arranged for the excellent distribution of otherwise deflecting and distorting loads, and also arranged for two possible modes of operation, and at all times being quickly adjustable to insert and to withdraw a portion of a rope line with respect to its passage over the sheave, comprising:

a. a load receiving and transmitting body having a centrally located vertical formed cavity to position and hold a load receiving means, and having integral opposite transversely extending body portions serving as integral pivot rod receiving supports with a horizontal formed cavity to receive respective pivot rod subassemblies, and having additional integral opposite transversely extending body portions spaced in pairs on respective sides of the said integral opposite transversely extending body portions which serve as the integral pivot rod receiving supports, each said pair of additional integral opposite transversely extending body portion terminating outwardly in a concave reenforcing abutment to come into play when the handline is subjected to high loading;

b. a load receiving means having a head portion to be secured to a load line, having a threaded shank to be positioned through the centrally located vertical formed cavity of the said load receiving and transmitting body, and having a subassembly of a bushing, washer, nut, locking pin, and lock nut, for securing the said threaded shank in the said centrally located cavity;

c. two spaced depending side housings having at their top integral paired and spaced convex pivot rod receiving supports, to complementary fit in the said concave reenforcing abutments of the said load receiving and transmitting body, with horizontal formed cavities to receive respective pivot rod subassemblies, which also are received in the said integral opposite transverse extending body portions of the said load receiving and transmitting body, to be thereby rotatably secured to the load receiving and transmitting body, having at their bottom integral extended receiving transverse supports having transverse cavities to receive a bottom securement subassembly of rivets and a sleeve, having at their integral mid portions on their insides a recessed structure to accommodate portions of a sheave, having at their integral mid portions on their outsides, a formed recess to non rotatably position end portions of an axle subassembly, at least one said outside recess having a circular crushable rib to be deformed during the initial rotative assembly of the said depending side housings, and also having at their integral mid portions a transverse hole to accommodate portions of an axle subassembly;

d. an axle subassembly of a bolt, sleeve, and nut, inserted through the transverse holes of the said respective integral mid portions of the said two spaced depending side housings, the final tightening of this axle subassembly, after installation of a sheave, occurring as the two said spaced depending side housings are rotated relative to one another until firmly contacting the ends of the said sleeve of this axle subassembly, the complete tightening being assured as the said circular crushable rib is deformed to the extent necessary as the said formed recesses non rotatably position the said end portions of the axle subassembly;

e. a sheave for placement on the said axle subassembly and positioned between said two spaced depending side housings for partial interfitting within their said inside recesses;

f. a bottom securement subassembly of rivets and a sleeve to secure together the said bottom integral extended receiving transverse supports of the said two spaced depending side housings; and

g. pivot rod securement subassemblies to rotatably secure the said two spaced depending side housings at their respective said spaced convex pivot rod receiving supports to the load receiving and transmitting body at its said integral opposite transversely extending body portions, one of these said pivot rod securement subassemblies having two rivets and a sleeve for riveted securement, and the other of these said pivot rod securement subassemblies having a sleeve, a pull out pin, and a secured tether to keep the pull out pin from falling away from the adjacent said depending side housing, the said pull out pin upon its withdrawal, clearing the respective said depending side housing at its top for outwardly pivoting to gain access to the sheave for removal or insertion of a pulley line.

3,899,159

DEVICE FOR TREATING SUBSTANCES CONSISTING OF AT LEAST ONE VESSEL AND ONE OR MORE STIRRING MEMBERS IN EACH VESSEL

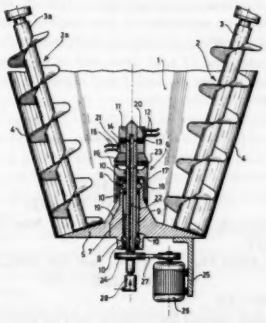
Constant Johan Nauta, Overveen, Netherlands, assignor to Nautamix Patent A.G., Zug, Switzerland

Filed June 10, 1974, Ser. No. 478,166

Claims priority, application Netherlands, June 15, 1973, 7308397

Int. Cl.[2] B01F *7/00*

U.S. Cl. 259—21 **9 Claims**



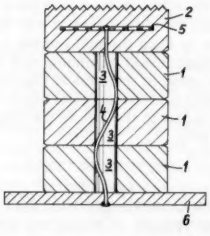
1. Device for treating substances e.g. mixing granular, pulverulent or pasty substances and/or liquids, comprising a vessel with a vertical axis of symmetry, at least one stirring member in said vessel, said member being situated at its upper

and bottom end eccentrically in said vessel, at least said upper end being supported in the free end of a member with opposite end rotatably supported in the vertical axis of symmetry of said vessel, means for rotating each stirring member about its own axis and simultaneously about the vertical axis of symmetry of said vessel, at least one combined system for locally producing a vortex motion in the surrounding substances to be treated and injecting at the same time a substance into said surrounding substances, arranged in that portion of the bottom of the vessel beyond the reach of said stirring member, said combined system comprising an injection pipe rotatably supported in the bottom of the vessel and provided with at least one longitudinal channel closed at its upper end, at least one spray member opening into said vessel, and at least one pair of stirring members provided on said injection pipe.

3,899,160
BUFFER

Wilhelm Schwarz, Wilhelmshaven, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Mar. 21, 1974, Ser. No. 453,560
Claims priority, application Germany, Mar. 22, 1973, 2314275
Int. Cl. F16f *3/08*
U.S. Cl. 267—152 **5 Claims**



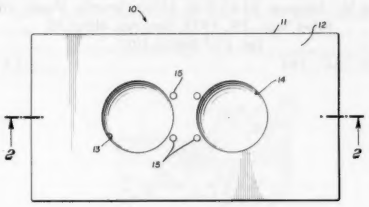
1. A buffer which includes: a first end plate, a second end plate arranged in substantially spaced relationship to said first end plate, a plurality of discs of cellular elastic material interposed between and bonded to said first and second end plates and also bonded to each other, said discs respectively being provided with axial passages substantially axially aligned with each other, and a holding member extending through said passages and interconnecting said end plates, the width of said passages being a multiple of the thickness of said holding member, said holding member in fully assembled condition of said end plates and of said discs and in the normal condition of said discs having an undulated contour with at least one undulation.

3,899,161
EGG CUTTING BOARD

John J. McGann, Jr., 1204 Tarball St., New Smyrna Beach, Fla. 32069

Filed May 13, 1974, Ser. No. 469,340
Int. Cl.[2] B25B *11/00*
U.S. Cl. 269—13 **6 Claims**

1. A kitchen utensil for cutting hard or soft boiled eggs and the like, comprises a base having a substantially flat upper surface, said surface has at least one pair of spaced apart depressions therein each having a size and shape to receive therein one end half of an egg and the like, and a plurality of projections extend upwardly from the surface between the pair of depressions to support an egg and the like thereon, so that when the egg and the like is cut substantially in the middle

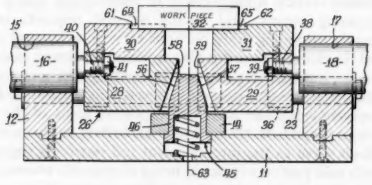


thereof, one end half thereof falls into each depression of the pair.

3,899,162
MULTI-LOAD SELF-CENTERING WORK HOLDING VISE

Hugo J. Fischer, 106 Sherwood Dr., Cary, Ill. 60013

Filed Sept. 27, 1974, Ser. No. 509,810
Int. Cl. B23q *3/06*
U.S. Cl. 269—25 **11 Claims**



1. In a self-centering vise for gripping a workpiece and comprising a frame, a pair of jaws mounted on the frame for movement along a path toward and away from each other, power means connected to the jaws for moving the jaws individually along said path toward and away from each other, and centering means for positioning said jaws, when they grip the workpiece, so that the workpiece is at a specific location along said path, the improvement wherein said centering means comprises:

said jaws having end faces adjacent each other and forming a first pair of faces;

a centering device normally positioned between said end faces and being mounted in said frame for movement only along a line at right angles to said path from said normal position to a displaced position, said centering device having side faces in juxtaposition to said end faces respectively, said side faces forming a second pair of faces;

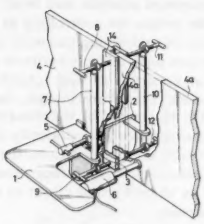
one of said pair of faces being positioned generally in the form of a V centered with respect to said line, whereby as said jaws move toward each other said end faces contact said side faces and apply a force to said device in a direction tending to move said device along said line toward said displaced position; and

means engaging said device and resiliently resisting movement of said device in said direction.

3,899,163
WELDING JIG FOR DECK LONGITUDINALS

Sakebu Minagi, Ichiharashi, Japan, assignor to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1974, Ser. No. 499,063
Claims priority, application Japan, Aug. 27, 1973, 48-00556
Int. Cl. B23k *37/04*
U.S. Cl. 269—37 1 Claim

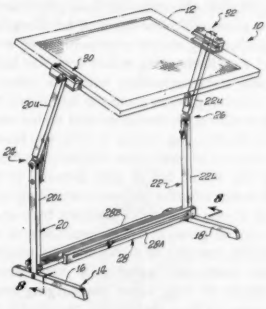


1. A welding jig for deck longitudinals comprising a horizontal support plate which is to be positioned adjacent the side of the deck longitudinals, a vertical support plate secured to said horizontal support plate having a recess with which a lower portion of one of the longitudinals may be engaged, a screw secured to said horizontal support plate for securing the support plates to said one longitudinal, a hydraulic cylinder, attached to said horizontal support plate for aligning the other longitudinal with said one longitudinal, and electroslag welding copper plate holding screws secured to said horizontal and vertical support plates.

3,899,164
ADJUSTABLE FLOOR SUPPORT FOR NEEDLECRAFT AND ART FRAMES

Raymond Newman, 1829 E. Edgecomb St., Covina, Calif. 91724

Filed Nov. 5, 1973, Ser. No. 412,646
Int. Cl.[2] B23Q *1/04*
U.S. Cl. 269—71 7 Claims

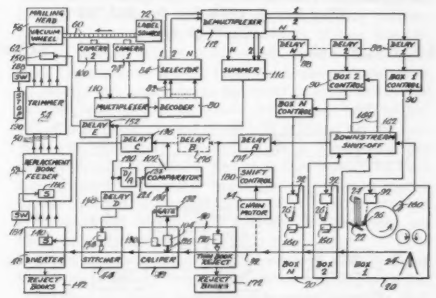


1. An adjustable floor support for needlecraft and art frames comprising:
- a pair of floor engaging feet;
- a pair of legs extending vertically from said feet and each including a knee joint for swinging an upper portion of each leg in a plane thereof to an inclined angle relative to a lower vertical portion of said leg;
- a longitudinally expandable and contractible cross member extending between said legs to laterally support said legs on said feet;
- variable mouth clamp means at an upper end of each leg for receiving and releasably gripping needlecraft and art frames of different thickness; and
- selectively operable means for releasably locking said knee joints in different positions to regulate the angulation between said upper and lower portions of said legs; and said feet each including floor engaging portions extending forward of said legs in the direction of swinging of said upper leg portions to balance and support said legs and frame against tipping upon a swinging of said upper leg portions to an inclined position.

3,899,165
SIGNATURE COLLATING AND BINDING SYSTEM

Stewart J. Abram, Elmhurst; David R. Denis, Winnetka; Alex E. Heinze, Glenview; Leonard M. Johnson, Downers, and Edward Taylor, Chicago, all of Ill., assignors to R. R. Donnelley & Sons Co., Chicago, Ill.

Filed Oct. 2, 1972, Ser. No. 297,993
Int. Cl. B65h *39/02*
U.S. Cl. 270—54 29 Claims



1. In a collating and binding system having a plurality of feeder means each responsive to actuation of an associated delivery means for delivering a signature to an adjacent station spaced along a conveyor, and processing means adjacent said conveyor for processing the books of signatures which have been progressively built by the feeder means to provide output books of signatures, the improvement comprising:
- source means having a plurality of outputs each corresponding to a different one of the plurality of feeder means, the source means generating a series of different combinations of signals at the plurality of outputs to form different books of signatures;
- a plurality of delay means each coupled between a different one of the outputs and a different one of the feeder means for selectively actuating the associated delivery means when signals are present at the associated outputs to progressively build said plurality of different books at the spaced stations;
- said processing means includes adjustable means having different positions for processing different thicknesses of books of signatures built by said feeder means;
- movable shaft means responsive to a total thickness signal for moving a shaft by a corresponding amount, the shaft driving said adjustable means to alternatively assume different positions corresponding to the total thickness signal; and
- summer means coupled to the plurality of outputs for summing each series of different combinations of signals to generate the total thickness signal coupled to the movable shaft means.

18. In a collating and binding system having a plurality of feeder means for delivering signatures to a plurality of stations along conveyor means and processing means adjacent said conveyor means for processing books of signatures progressively built by the feeder means, the improvement comprising:
- diverter means responsive to a predetermined condition for

diverting a single book of signatures from said conveyor means to create an open station;

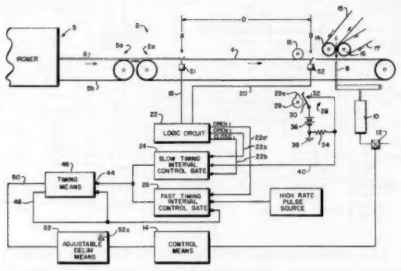
book hopper means for storing a plurality of replacement books of signatures, including an active storage section with delivery means actuable to feed a single replacement book of signatures to said conveyor means and a buffer storage section for storing replacement books for the active storage section, detector means associated with said active storage section for determining when additional replacement books are required from said buffer storage means, and controller means responsive to said detector means for transferring a predetermined number of replacement books from said buffer storage means to said active storage means; and

control means for actuating said delivery means to fill the open station with the replacement book of signatures.

3,899,166
LAUNDRY FOLDING MACHINE

Sheldon P. Behn, Highland Park, Ill., assignor to Super Laundry Machinery Company, Inc., Chicago, Ill.

Filed Dec. 7, 1973, Ser. No. 422,702
Int. Cl. B65h *45/18*
U.S. Cl. 270—83 **3 Claims**

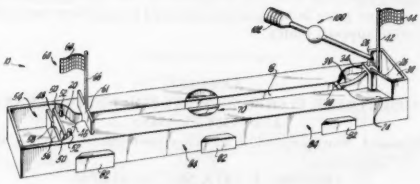


1. In flatwork piece folding apparatus for folding a flatwork piece at a given point behind the leading edge thereof a given proportion of the length of the flatwork piece carried by conveyor means moving the same past a folding station in a direction parallel to the length thereof, said folding station having folding means for forming a lateral fold in a portion of the flatwork piece located opposite thereto at the folding station, the conveyor means moving the flatwork piece through a length measuring area where the flatwork piece is moved first past a first position sensing point in advance of said folding station at a speed which initially at least may differ from the speed of said conveyor means, and then past a second point beyond said first point, there being first article position sensing means for providing a first signal when the leading edge of the article has reached said first position sensing point and a second signal when the trailing edge of the flatwork piece leaves said first position sensing point, and signalling means for providing a third signal when the leading edge of said article reaches said second point; and control means for controlling the point in time when said folding machine is operated, said control means including resettable timing means which when operated has a characteristic which progressively varies in value at a controlled variable rate, means responsive to said characteristic value reaching a given control value by effecting operation of said folding means, timer operating means initially responsive to respectively different combinations of said signals indicating the movement into said measuring area of a flatwork piece having a length greater or equal to the spacing between said first and second points, on the one hand, and a flatwork piece of a length less than the spacing between said first and second points, on the other hand, for initially operating said timing means at a given rate related to the actual speed of movement of said folding piece in said measuring area, and then responsive to signals generated by the passage of the trailing edge of a flatwork piece having a length equal to or greater than the spacing between said first and second points past said first point, on the one hand, and the movement of the leading edge of a flatwork piece to said second point, on the other hand, by operating said timing means at a substantially different rate also related to the actual speed of movement of said flatwork piece in said measuring area, and means for resetting said timing means after said characteristic has reached said control value, the improvement wherein said timer operating means includes rotatable means for controlling at least initially the speed of operation of said timing means so said characteristic of said timing means progressively varies in proportion to the speed of rotation imparted to said rotatable means by the passage of a flatwork piece therebeneath, the rotatable means being positioned to be rotated by the movement of a flatwork piece in said measuring area independently of the actual speed of movement of said conveyor means, the rotatable means being located between said first position sensing point and said second point so as to be located closer to said second point than to said first point.

3,899,167
AQUATIC SPEEDWAY

Harold N. Braunhut, 200 Fifth Ave., New York, N.Y. 10010

Filed Aug. 14, 1973, Ser. No. 388,240
Int. Cl.[2] A63K *1/00*
U.S. Cl. 272—4 **27 Claims**



1. An aquatic speedway for racing aquatic animals that tend to swim against the direction of flow of a current of water, comprising a raceway in the form of an elongate open channel; water discharging means communicating with one end of said channel for discharging water into the latter; water receiving means communicating with the other end of said channel for receiving water from the latter; and water transfer means for transferring water from said water receiving means to said water discharging means to raise the level of the water above said channel in said water discharging means and lower the level of the water below said channel in said receiving means, said water transfer means comprising a tubular member provided at one end with a resilient bulb and at the other end with an opening and in the general form of an eyedropper device, whereby transfer of water may be manually effected, and whereby continued transfer of water from said water receiving means to said water discharging means causes a current of water to flow therebetween suitable for racing the aquatic animals from the region of said water receiving means to said water discharging means.

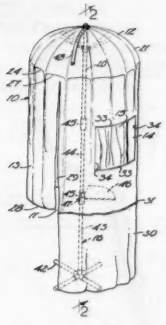
3,899,168
UMBRELLA PUPPET STAGE

Stella Besherse, Rt. 1, Box 82, Othello, Wash. 99344

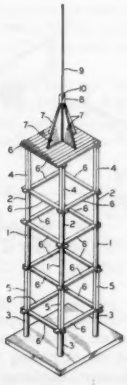
Filed July 18, 1974, Ser. No. 489,706
Int. Cl.[2] A63J *19/00*
U.S. Cl. 272—21 **6 Claims**

1. A portable puppet stage for concealing a puppeteer and for providing a performing area for a puppet, comprising:

a central upright support;
a collapsible umbrella roof on said support having a circular peripheral roof edge;
a circumferential skirt of flexible fabric depending from the peripheral roof edge to form an enclosure with the roof for concealing the puppeteer;
a stage opening extending through said skirt at a location thereon between top and bottom skirt edges; and
a backdrop within the enclosure, depending from a portion of said umbrella roof spaced inwardly from said peripheral roof edge, said backdrop depending to a lower edge terminating below said stage opening and above the bottom skirt edge and spaced inwardly from the stage opening a sufficient distance to define a performing area between the backdrop and the stage opening in which the puppet may be manipulated by the puppeteer with the backdrop further concealing the puppeteer and said backdrop also being sufficiently close to said stage opening to provide a background setting for the performing area.

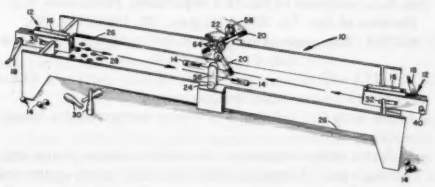


3,899,169
BUILDING GAME
Timothy L. Rhodes, 250 Curtis St., and John L. Wagner, 2389 Medina Rd., both of Medina, Ohio 44256
Filed Sept. 12, 1973, Ser. No. 396,607
Int. Cl.[2] A63F 9/00; A63H 33/06
U.S. Cl. 273—1 R **7 Claims**



1. A game apparatus comprising:
groups of like game pieces for constructing a representation of a skyscraper type framework;
the game pieces of each group being readily distinguishable from those of other groups and being adapted for, and having, predetermined permitted positions in which they can be assembled in the framework; the permitted positions for the pieces of some groups being different from the permitted positions of pieces of other groups;
each of the pieces of one group being an elongated pillar which has planar parallel ends normal to its longitudinal axis, and each of said ends of each pillar being of such size and cross section and so related to the length of the pillar that when the pillar is disposed on one end on a horizontal planar surface with its axis upright and is free from laterally imposed extraneous forces, it is capable of remaining in upright position against the forces of gravity, but with a low degree of stability against toppling;
each of the pieces of another group being a cross beam which is relatively long and narrow and which has on one face a pair of parallel coplanar face portions and on its opposite face a pair of coplanar face portions parallel to those on said one face;
the face portions of the pair disposed at one face of the cross beam being related in length and breadth to the ends of the pillars, respectively, so that the face portions can be juxtaposed on the upper ends of two laterally spaced upright pillars, respectively, when their upper ends are coplanar and the faces are horizontal and when so juxtaposed, can support the cross beam in horizontal position, and so that the lower ends of two such spaced pillars can be supported in upright position on the face portions, respectively, opposite those supporting the cross beam on the pillars, and each face portion of each beam extending from a location inwardly from its associated end of the beam a greater distance than the greatest cross sectional dimension of said ends, respectively, entirely to said associated end;
said pillars and cross beams and the game as a whole being free from accessory connectors and connecting portions, other than frictional engagement between the pillar ends and the said faces, which can mechanically hold the beams and pillars together in assembled relations and which can constrain them from movement relative to each other; and so that the pillars and cross beams are held in said assembled relations solely by friction between said juxtaposed ends of the pillars and the associated face portions of the cross beams under gravitational forces acting on said groups of game pieces, and said groups being the only pillars and only cross beams, respectively, of said game so related to each other; and
the ratio of the length of each pillar to the maximum transverse dimension of its ends, respectively, falls within a range from about 3.6 to about 7.7.

3,899,170
GAME APPARATUS WITH SPINNABLE TARGET
Lloyd Parks, deceased, late of Arlington, Va., and Dwight C. Brown, 5712 N. 20th St., Arlington, Va. 22206
Filed May 8, 1973, Ser. No. 358,367
Int. Cl. A63b 63/06; A63f 7/10, 7/14
U.S. Cl. 273—38 **7 Claims**



1. A game apparatus comprising an elongated housing having upstanding side walls, end walls and a generally planar

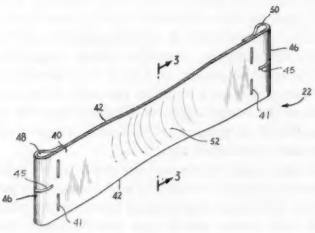
deck defining a playing surface, chute means defined in said deck and being inclined and extending toward at least one of said end walls, said playing surface being inclined toward said chute means, a threaded shaft extending over said deck in spaced relation thereto and removably mounted in said side walls, at least two spinner means rotatably mounted on said shaft in loosely threaded engagement therewith and adapted to move longitudinally relative to said shaft when rotated, pivotably mounted propelling means extending through each of of said end walls and adapted to propel projectiles over said deck for striking said spinner means and causing rotation thereof, said chute means including a chute extending adjacent each of said side walls, each said chute being inclined toward an opposite one of said end walls, and wherein said playing surface is sloped from the longitudinal centerline thereof toward each of said chutes, respectively.

3,899,171

BOWLING BALL DECELERATOR

Herbert C. Haller, Newtonville, N.Y., assignor to Albany International Corporation, Albany, N.Y.

Filed June 17, 1974, Ser. No. 479,790
Int. Cl. A63d *5/02*
U.S. Cl. 273—47 **7 Claims**



7. An article for snubbing round, moving articles which comprises:

a hard surfaced, resilient textile fabric body which comprises:

a. a base layer of woven synthetic material comprised of at least one filament;

b. a webb of synthetic fiber needled to said base layer;

c. a polymeric resin saturant; and

d. means for attaching said article at the ends thereof to a mount; said article having a generally rectangular shape, a thickness less than its width and a portion which follows an arcuate path from edge to edge across its width; the base layer being on the outside of the arced portion.

3,899,172

TENNIS RACKET HAVING IMPROVED STRENGTH FACTOR

George A. Vaughn, and Richard D. Hargrave, both of Princeton, N.J., assignors to Maark Corporation, Plainsboro, N.J.

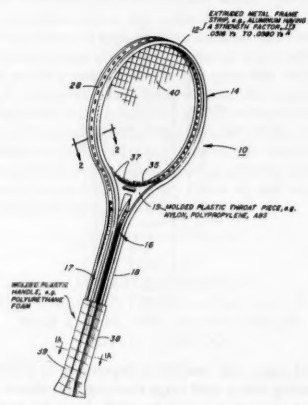
Division of Ser. No. 853,676, Aug. 28, 1969, Pat. No. 3,702,701. This application June 9, 1972, Ser. No. 261,344
Int. Cl. A63b *49/12*
U.S. Cl. 273—73 C **1 Claim**

1. A tennis racket structure comprising:

a frame strip for defining a stringing section and a handle section;

said frame strip comprising an extruded metal frame strip having a pair of opposed outer tubular sections connected by a web and being shaped to partially define a generally oval section and a pair of spaced apart generally parallel handle end sections and said web cooperating with said pair of tubular sections to define on one side thereof a generally rectangular channel and on the other side thereof a generally trapezoidal channel;

said frame strip having a cross-sectional configuration for defining a strength factor (IY_a/A) in the range of $0.0516(in^2)\ Y_a$ to $0.0580\ (in^2)Y_a$ wherein the strength factor is the ratio of the moment of inertia $I(in^4)$ of the frame strip around the longitudinal axis thereof to the transverse cross-sectional area $A(in^2)$ of the strip material, and Y_a is the yield stress of the strip material;



a throat piece consisting solely of plastic and including a pair of opposed surfaces shaped complementarily to conform to the shape of said generally trapezoidal channel of said frame strip and wherein said plastic throat piece possesses such flexibility and resiliency as to prevent deformation in torsion in the throat area of the tennis racket frame in normal play; and

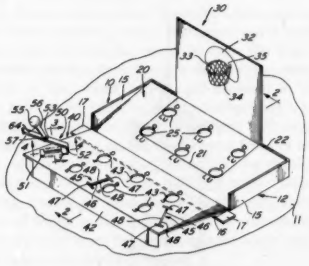
handle means.

3,899,173

SIMULATED BASKETBALL GAME

Louis Zaris, 43 N. Tallahassee Ave., Atlantic City, N.J. 08401

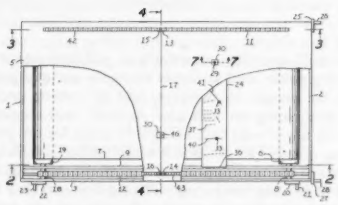
Filed Dec. 5, 1973, Ser. No. 421,976
Int. Cl.² A63F *7/10*
U.S. Cl. 273—85 E **5 Claims**



1. A simulated basketball game comprising a board having an inclined upper surface providing a playing field with one edge uppermost, said board having ballreceiving openings, "offensive" and "defensive" markings on said surface associated with respective ball-receiving openings, an upright support removably positioned at said one edge of said board upstanding therefrom, a base tray having side walls and removably receiving said board, said support having its lower region removably inserted between said board and one tray

side wall, a basket carried by said support spaced over said playing field for receiving a projected ball, a separate ball projector freely selectively positionable for aerially projecting a ball toward said basket, and an extension on said board extending out of and beyond said tray opposite to said one tray side wall, said extension inclining away from said board and combining therewith to define a gully for receiving rolling balls.

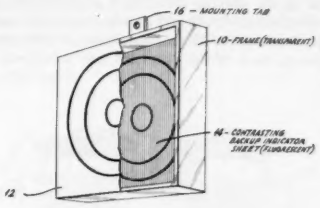
3,899,174
FOOTBALL GAME
James P. Berarducci, 1769 W. 26th St., Erie, Pa. 16508
Filed May 4, 1973, Ser. No. 357,223
Int. Cl. A63f *7/06*
U.S. Cl. 273—94 R **15 Claims**



1. A simulated game including a first playing piece representing a first player,
a second playing piece representing a second player,
a playing field made up of a sheet of relatively rigid material having a slot extending along each side thereof and supporting said players,
a belt made of magnetic material having a part movable in a plane parallel to said playing field, means supporting said belt on said game,
a template supported between said belt and said playing field,
means mounting said template to provide relative movement between said template and said belt,
a transfer member supported on said template,
means on said transfer member for exerting a force on said belt whereby said belt moves said transfer member relative to said template,
means on the upper end of said transfer member for exerting a force on said playing pieces whereby said playing pieces move over said playing surface in accordance with the movement of said transfer member along said template.

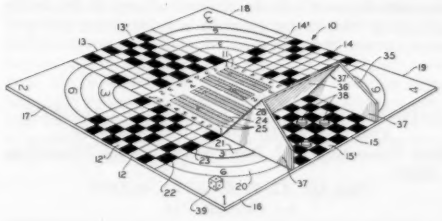
3,899,175
INDICATING TARGET EMPLOYING FOIL SHEET
James M. Loe, Scottsdale, Ariz., assignor to D. R. Pressman, San Francisco, Calif.
Filed Aug. 22, 1973, Ser. No. 390,590
Int. Cl.[2] F41J *3/00*
U.S. Cl. 273—102.1 C **9 Claims**

1. An indicating target for producing a point of impact indication of substantially increased visibility comprising a sheet of metal foil having a target pattern on the front surface thereof and means for mounting said sheet in a flat upright position, the part of said sheet having said target pattern thereon being free from all other elements of said target so that substantially any portion of said sheet may be torn and freely displaced from the rest of said sheet by the impact of a projectile, a backup sheet having a color contrasting to the



coloring on the front of said foil sheet, and means for mounting said backup sheet in spaced relation behind said foil sheet.

3,899,176
GAME APPARATUS
Daniel P. Gregan, 4773 Wolff Dr., Brunswick, Ohio 44212
Filed Oct. 15, 1974, Ser. No. 514,431
Int. Cl. A63f *3/00*
U.S. Cl. 273—130 R **10 Claims**

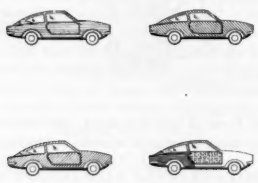


1. A game apparatus comprising a game board having a plurality of like grids disposed around the board and oppositely paired across the board; each said grid having right angularly intersecting rows of grid spaces, said grid spaces defining certain rows aligned across the board with like rows in the opposite grid, and transverse rows disposed perpendicularly with respect to said certain rows; said game board having means defining connecting bands connecting at least one transverse row of grid spaces in each grid with the corresponding transverse row in the next adjacent grid around said game board; said certain rows of grid spaces and said connecting bands being assigned arbitrary scoring values; a plurality of playing pieces adapted to be positioned on said grid spaces; and a blinder for each said grid for shielding the disposition of playing pieces until all playing pieces are in place whereby upon removal of said blinders, scoring is determined by the number of playing pieces in the corresponding one transverse row of a next adjacent grid around said board and by the number of playing pieces in any said certain row of a grid as compared with the playing pieces in the certain row aligned therewith in the opposite grid.

3,899,177
AUTOMOBILE RACING BOARD GAME APPARATUS
Bertram C. Sells, Box 90, Conover, Wis. 54519
Filed June 6, 1974, Ser. No. 476,910
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—134 AD **4 Claims**

1. Automobile racing game apparatus comprised of a game board having thereon a pictorial representation of an automobile racing track, said track including a starting line, and a finish line, and being divided into a quantity of spaces; a plurality of playing pieces, each assignable to a different player, and each of said playing pieces being of a single different color each different color representing a body color of

frequently observed vehicles; each of said playing pieces manually advanced from said starting line to said finish line, said advance being one space for each vehicle observed of the same color as the playing piece by a single player during a predetermined time period; and an additional playing piece of a plurality of colors all different than those of said plurality of playing pieces, each of the colors of said additional playing



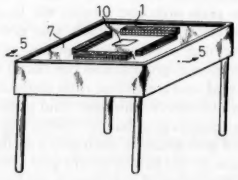
piece representing a vehicle body color observed substantially less frequently than the vehicle body colors represented by the colors of said plurality of playing pieces, said additional playing piece manually advanced from starting line to finish line one space for each vehicle observed of any of the colors included in said playing piece by a single player during a predetermined time period.

3,899,178

AUTOMATIC GAME BLOCK SHUFFLING, ALIGNING AND TABLE TOP ARRAYING MACHINE

Hideo Watanabe, 3-2-17, Daiei-cho, Shibata-shi, Niigata-ken, Japan

Filed Apr. 22, 1974, Ser. No. 463,043
Int. Cl. A63f *1/14*
U.S. Cl. 273—136 A **27 Claims**



1. An automatic shuffling and table-top-arraying machine for Mah-Jongg blocks, card game blocks, and blocks for other indoor games characterized as a game block arraying machine utilizing two sets of Mah-Jongg game blocks and other game blocks having the same shape as Mah-Jongg game blocks, which comprises:

a. game blocks that allow their head side and tail side to be automatically discriminated;

b. a throw-in mechanism for throwing said game blocks into an orientation mechanism after a game is over;

c. the orientation mechanism for receiving said game blocks, shuffling them, arranging them in uniform orientation as to their longitudinal, lateral as well as head-tail attitudes, and guiding them out towards the next mechanism;

d. an aligning mechanism for aliging said guided-out game blocks into such an attitude that is determined by the mounting mechanism, and aligning them in units of such numbers that are determined by the nature of the game for which the game blocks are intended;

e. an arraying mechanism for arraying said aligned game blocks into a formation identical with or similar to the formation in which the game using these game blocks is to be started, underneath the table; and

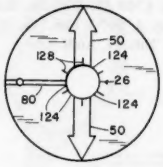
f. a mounting mechanism for lifting said arrayed game blocks and mounting them on the table top in the formation suited for starting the game.

3,899,179

GOLFER'S TRAINING AID

Anthony R. Vlach, 3205 S. 48th, Omaha, Nebr. 68106

Filed Aug. 20, 1973, Ser. No. 390,076
Int. Cl. A63b *69/36*
U.S. Cl. 273—183 A **6 Claims**



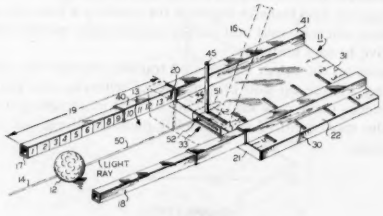
1. A golf assembly comprising a golf ball and a ball-top golf-swing guide, said assembly being for use at a golf course tee, in the rough, on fairways, and on putting greens, said guide comprising an indicator support, said support being rested on top of said ball, said guide being for the purpose of assisting a golfer to position himself for his golf-swing to hit said ball in an intended flight direction extending in an intended flight line to one side of said support, first indicator means on said support and visible from the top of said support, said first indicator means being substantially alignable with said flight line, said first indicator means being parallel to a radius line extending horizontally outward from the center of said ball, said first indicator means as seen from above being substantially aligned with a horizontally extending radius line of said ball, said support being balanced sufficiently so that it rests with stability on top of said golf ball.

3,899,180

PUTTING PRACTICE GAGE

John J. Rodman, 950 Main St., S. Williamsport, Pa. 17701

Continuation of Ser. No. 337,642, March 2, 1973, abandoned. This application Feb. 19, 1974, Ser. No. 443,322
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—183 R **7 Claims**



1. A putting practice gage for relatively positioning a golf ball and putter on an external green putting surface adjacent a hole for judging variable stroke lengths and for guiding the direction of the stroke to improve skills in putting stroke and touch, comprising in combination, a backstop member to be placed on said green putting surface with structure enclosing an unobstructed portion of the green surface upon which the ball is to be placed near the hole for a full putting stroke into contact with the ball, the backstop being positioned for arresting movement of the putter stroke adjacent said green putting surface at the back end of a stroke, said structure including

gage structure including a pair of parallel guides extending from the backstop member which constitutes the sole connection member therebetween in contact with the green and the guides located on opposite sides of the putter thereby to receive the ball therebetween in contact with the green for impact by a stroke from the putter adjacent the green surface being confined only to a normal position between the two guides to gage the putter stroke through a straight putting stroke of predetermined length with unrestricted view along the green in front of the putter while stroking and impacting the ball in the putter path along and substantially parallel to said green putting surface, and indexing means on said guides to mark the position of the ball to be placed on the putting surface intermediate the ends of said guides at a predetermined distance from the backstop member thereby to establish a stroke length gage, whereby the ball is placed on said green putting surface, said gage structure establishing the putter placement position at said backstop and confining the putter movement only at the backstop and sides along said guides to establish the direction of the stroke and gaging the length of the stroke along the green surface from the backstop to the ball placement impact position by said indexing means at a marked position whereby a person can use the gage to establish and repeat proper putting stroke lengths and impact positions with the putter and ball normally positioned on the actual green surface.

3,899,181
PLAYBACK METHOD AND SYSTEM

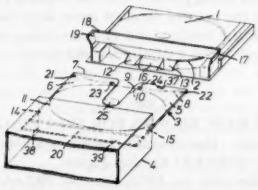
Dietmar Dannert; Rainer Ihlenburg; Dietrich Nackmayr; Rudolf Goetze; Wolfgang Kruger; Hartmut Peter; Klaus Westphal, and Hans-Joachim Thuy, all of Berlin, Germany, assignors to TED Bildplatten Aktiengesellschaft, Zug, Switzerland

Division of Ser. No. 284,173, Aug. 28, 1972, abandoned. This application May 28, 1974, Ser. No. 474,448

Claims priority, application Germany, Aug. 26, 1971, 2143382

Int. Cl. G11b *17/04, 17/26*

U.S. Cl. 274—1 R **20 Claims**



1. A playback device for a disc-shaped record carrier which is inserted into and removed from the playback device while contained within a protective cover, comprising: a drive apparatus; means defining a playback surface; means defining an insert opening to said playback surface; transporting means for sequentially inserting such a protective cover through said insert opening and onto said playback surface, and removing such cover, through said insert opening, from said playback surface; holding means disposed for holding a record carrier on said playback surface after the first such insertion and during the first such removal, for permitting the cover to be withdrawn from the carrier, and for releasing such carrier at least after the second such insertion for permitting the record carrier to be removed from the playback surface together with its associated cover during the second such removal; means for centering the record carrier with respect to the playback surface; and mechanical means disposed in the vicinity of said insert opening for effecting a spreading of the protective cover opening for reinserting the record carrier into the protective cover.

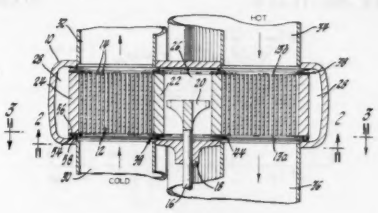
3,899,182
HIGH TEMPERATURE SEAL

John N. Johnson, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 414,748, Nov. 12, 1973, abandoned. This application Mar. 28, 1974, Ser. No. 455,675

Int. Cl. F28d *19/00*

U.S. Cl. 277—96 R **3 Claims**



1. A rubbing contact fluid sealing member comprising a base member and a porous layer formed of a metal having temperature resistance and oxidation and sulfidation resistance at temperatures in excess of 1,200°F adapted for rubbing contact bonded to at least a portion of said base member with a seal material filling the pores of said layer and bonded therein, said layer having a pore density in the range of about 10 to 100 pores/inch, and said seal material consisting essentially of a potassium silicate-bound mixture of copper chromite and chromic oxide in which the mixture contains about 47 to about 88 percent copper chromite and comprises about 88 to 92 percent by weight of the seal material.

3,899,183
SLIDE-PROOF BELL AND SPIGOT JOINT FOR PIPES AND TUBULAR ELEMENTS

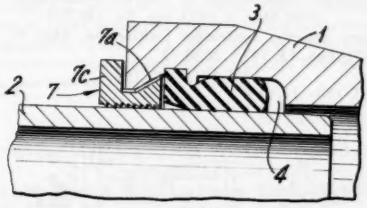
Max Wild, Gelsenkirchen; Wolf-Dieter Schneider, Essen; Friedel Sennlaub, Gelsenkirchen, and Rudolf Winter, Wattenscheid, all of Germany, assignors to Rheinstahl AG, Germany

Filed Nov. 26, 1973, Ser. No. 419,143

Claims priority, application Germany, Nov. 25, 1972, 2257821

Int. Cl. F16j *15/04*

U.S. Cl. 277—101 **9 Claims**



1. In a slide-proof bell and spigot joint, for pipes and tubular elements, of the type having a seal ring between the bell and the spigot and securing elements located axially outwardly of the seal ring and pressed against the spigot end portion, the improvement comprising, in combination, the outer end portion of the bell being formed with angularly spaced radial recesses in its inner surface which decrease in radial depth axially toward the outer end surface of the bell and circumferentially of the bell; and respective wedge shape pieces inserted axially into said recesses and firmly seated therein by relative movement circumferentially of the bell; said wedge shape pieces having a nose projecting from the associated recess and

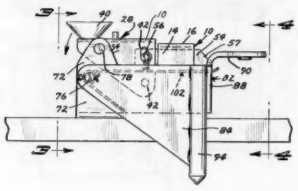
teeth engaging the spigot end portion and extending substantially circumferentially of the joint.

3,899,184

BRAKE FOR A SNOW SKI

George S. Haddad, 515 E. Fourth St., Duluth, Minn. 55803

Filed May 24, 1973, Ser. No. 363,388
Int. Cl. A63c 7/10, 11/00
U.S. Cl. 280—11.13 B 10 Claims



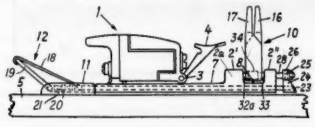
1. A brake for a snow ski comprising:
a. a central mount including means for securing the central mount to the snow ski,
b. a latch,
c. means for mounting said latch within said central mount allowing horizontal reciprocation thereof,
d. means located adjacent said central mount for horizontally reciprocating said slidable latch,
e. a yoke,
f. means pivotally mounting said yoke on a ski and adjacent said central mount,
g. said yoke having ground engaging means,
h. said yoke having an aperture for receiving said latch when said latch is moved by said latch moving means whereby said ground engaging means of said yoke is held in ground engaging position below the surface of the ski,
i. means for urging said yoke in a raised, nonground engaging position relative to the means for pivotally mounting the yoke when said latch is withdrawn from said aperture of said yoke, and
j. said means for moving said latch includes a saddle pivotally mounted on said central mount and connected to said latch.

3,899,185

SKI BRAKE MECHANISM

Hans Martin, Wildenstrasse 25, Oberwil, Switzerland

Filed Mar. 5, 1973, Ser. No. 338,224
Claims priority, application Switzerland, Mar. 8, 1972, 3386/72; Feb. 13, 1973, 2030/73
Int. Cl. A63c 7/10
U.S. Cl. 280—11.13 B 5 Claims



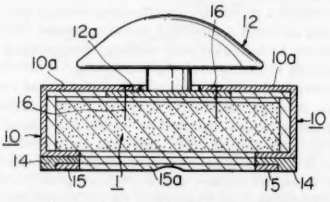
1. A brake mechanism adapted to be secured to a ski having a safety ski binding for braking the ski, comprising at least one braking element which upon release of the ski boot from the ski binding is automatically movable from a preparatory braking position, disposed above the running surface of the ski, downwardly into a ski braking position, to thereby engage the snow for the purpose of exerting a braking force upon the ski, a control element actuable upon inserting the ski boot into the ski binding for retaining said braking element in a preparatory braking position constituting a non-braking position, so that upon release of said control element said braking element moves from said preparatory braking position into said ski braking position, said braking element assuming an arrested position for convenient transport and storage during non-use of the ski, a locking element-pawl arrangement having components for holding said braking element in the arrested and preparatory braking positions, the improvement comprising; a bearing body including transverse web means extending upwardly from the ski for mounting said braking element, said braking element having an arm including a transversely extending base region,
means for pivotally mounting the braking element about a longitudinal axis on said web means such that said base region of said arm extends adjacent the web means, said means for pivotally mounting including torsion spring means for biasing said braking element to pivot outwardly of the ski;
said components comprising a bolt mounted for longitudinal movement along its axis within a bore in said web means,
means interconnecting said control element and said bolt for simultaneous movement,
said bolt including a stepped end of reduced diameter,
said components further comprising a sleeve mounted for axial and non-rotatable longitudinal movement within said base region of said braking element, a compressed spring within said base region biasing the sleeve to extend from the brake element into said bore in the web means, a second bore in said sleeve sized to receive only said steped end of the bolt, said stepped bolt end having a diameter less than the diameter of said second bore, said sleeve further having a beveled end sloping downwardly away from the web means;
said sleeve when engaging with the first said bore holding the braking element in the arrested position, said control element upon insertion of the ski boot into the ski binding moving said bolt so as to displace the sleeve out of said bore to release the brake from the arrested position of the braking element and to permit the braking element to assume the preparatory position, said sleeve bore in cooperative action with the stepped end of said bolt holding the braking element in the preparatory position, the braking element being pivoted into the braking position upon release of the control element upon departure of the ski boot from the binding and corresponding movement of the stepped end out of said second bore.

3,899,186

SKI HAVING BASE BLOCKS FOR SECURING BINDINGS

Hideki Matsuda, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed July 26, 1973, Ser. No. 382,663
Claims priority, application Japan, Aug. 1, 1972, 47-77106
Int. Cl. A63c 9/22
U.S. Cl. 280—11.13 W 5 Claims



1. An improved ski comprising, in combination, an elongated main body having a substantially rectangular cross-section and being provided with surface cut-outs, said cut-outs forming walls substantially perpendicular to major surface areas of said main body, a pair of base blocks having J-shaped cross-sections in said surface cut-outs, said base blocks com-

prising upper plates and lower plates interconnected by side plates substantially perpendicular to said upper and lower plates, said upper plates being provided with substantially parallel confronting edges, said confronting edges of said upper plates forming a longitudinally elongated gap therebetween, said base blocks being further provided with end edges adjacent said confronting edges and confronting said cut-out walls, said base blocks each abutting at least three surfaces of said main body, and a base plate of a ski binding affixed to said upper plates of said base block.

3,899,187

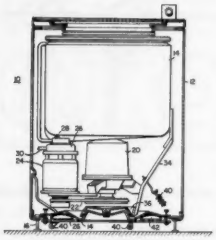
PNEUMATIC LIFTING MECHANISM

Bradburne L. Millett, Mansfield, Ohio, assignor to White-Westinghouse Corporation, Cleveland, Ohio

Continuation of Ser. No. 303,580, Nov. 3, 1972, abandoned. This application May 22, 1974, Ser. No. 472,340

Int. Cl.[2] B62D *21/18*

U.S. Cl. 280—43.24 **6 Claims**



1. A mechanism for transferring the support of an appliance from a generally stationary relationship on a surface to a generally easily movable relationship on the surface; said appliance having a bottom structural member generally adjacent said support surface, and means attached to said structural member providing frictional contact with said support surface for normally stationarily supporting said article wherein said transferring mechanism comprises:

a support plate interposed between said structural member and said support surface, said plate defining a first surface facing said structural member and an opposite surface facing said support surface;

means for attaching said support plate to said structural member for guided relative movement of one with respect to the other said attaching means including means for positively limiting said movement to a predetermined maximum amount;

a plurality of casters attached to said opposite surface of said plate; and,

inflatable means interposed between said structural member and said first surface of said plate for resiliently urging one away from the other to said predetermined amount which is sufficient to cause the casters to contact the support surface in an appliance weight bearing relationship whereby,

the weight of the appliance is transferred from said frictional support members to be supported on said casters for easy portability by said casters rolling on said support surface and said appliance is generally rigidly maintained in said caster supported position by abuttment of said movement limiting means.

3,899,188

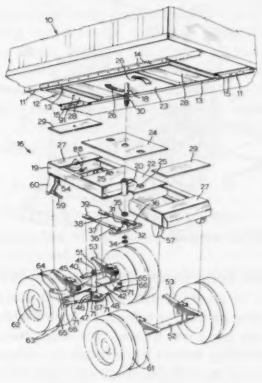
SELF-STEERING BOGIES FOR TRAILERS

Norman Royce Curry, Mississauga, Canada, assignor to Auto Steering Trailers Limited, Mississauga, Canada

Filed Feb. 11, 1974, Ser. No. 441,119

Int. Cl. B62d *7/16, 13/00*

U.S. Cl. 280—81 A **13 Claims**



1. A self-steering bogie for a trailer, comprising a member rigidly securable at the underside of the trailer to move therewith as the trailer rounds a curve, a bogie frame that can turn at the underside of the frame about a swivel axis, a shaft on said swivel axis, said shaft being fixed against rotation relatively to said rigidly securable member and extending downwardly therefrom through said bogie frame, first crank means rigidly connected to said downwardly extending shaft, a rear axle beneath the rear of the bogie frame, a front axle parallel to said rear axle and beneath the front of the bogie frame, an equalizing suspension system connecting the front and rear axles to the bogie frame, rear wheels supporting said rear axle, front wheels, a steerable assembly supporting said front axle on said front wheels, said steerable assembly including stub axles carrying said front wheels, king pins connecting said stub axles to the ends of said front axle for steering movements relative thereto, track rod means interconnecting the stub axles to maintain a predetermined relationship between their steering movements about the king pins, and drag link means connecting said first crank means and said steerable assembly, and second crank means pivotably connected to the front axle and operatively connected to the track rod means and drag link means to transmit steering movements from said first crank means to said steerable assembly.

3,899,189

UNIVERSAL MANUAL DRIVE FOR A WHEELED VEHICLE

Mervyn M. Watkins, 30241 Via Borica, Rancho Palos Verdes, Calif. 90274

Filed Oct. 25, 1974, Ser. No. 518,079

Int. Cl.[2] B62M *1/14*

U.S. Cl. 280—211 **7 Claims**

1. A universal manual drive for a vehicle having a pair of manually driven wheels, comprising:

first and second pairs of inner and outer hand rims;

first means mounting said first pair of hand rims on said vehicle in such a position that said first pair of hand rims will be accessible to the left hand and arm of an occupant of said vehicle;

second means mounting said second pair of hand rims on said vehicle in such a position that said second pair of hand rims will be accessible to the right hand and arm of said occupant;

first means connecting said outer hand rims together whereby manual rotation of one outer hand rim will rotate the other outer hand rim;

second means connecting one of said inner hand rims to one of said manually driven wheels and the other of said inner hand rims to the other of said manually driven wheels for rotation by an associated one of said inner hand rims;

first coupling means for selectively, releasably coupling said first inner hand rim to said first outer hand rim; and

second coupling means for selectively, releasably coupling said second inner hand rim to said second outer hand rim.

3,899,190

SKI BOOT HAVING INTERNAL BINDING COMPONENTS

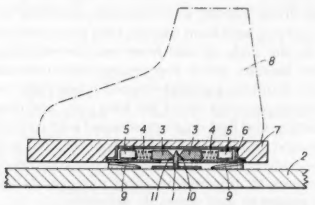
Gottfried Schweizer, Vienna, and Thomas Gordon Smolka, Wien-Mauer, both of Austria, assignors to Gertsch AG, Zug, Switzerland

Filed Feb. 7, 1972, Ser. No. 223,867

Claims priority, application Austria, Mar. 12, 1971, 2138/71The portion of the term of this patent subsequent to Nov. 20, 1990, has been disclaimed.

Int. Cl. A63c *9/08*

U.S. Cl. 280—11.35 R **8 Claims**



1. A releasable ski binding for releasably securing the sole of a ski boot to a ski, comprising:

post means fixedly secured to said ski and extending upwardly therefrom and having means defining a pair of locking recesses thereon each facing in opposite longitudinal directions relative to said ski;

housing means mounted on the sole of said ski boot;

first locking means mounted on said housing means;

second locking means mounted on said housing means and adapted to move longitudinally parallel to the longitudinal axis of said ski boot toward and away from said first locking means, an opening being defined between said first locking means and said second locking means when said first and second locking means are moved away from each other for receiving said post means therein, said first and second locking means both being adapted to engage said post means, while in said opening, in one of said locking recesses; and

resilient means for effecting and urging together of said first and second locking means into engagement with said post means, said first and second locking means being movable out of engagement with said recesses against the force of said resilient means to effect a release of the ski binding whenever said longitudinal axis of said sole of said ski boot is twisted out of parallel relationship with the longitudinal axis of the ski beyond a predetermined angular displacement, said resilient means effecting a restoration of said boot to a normal operating position whenever the twisted angular displacement of said ski boot relative to the ski is less than said predetermined angular displacement.

3,899,191

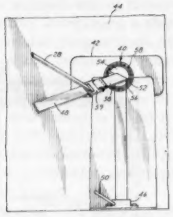
VEHICLE-MOUNTED SEAT BELT ASSEMBLY

Robert E. Royce, 4345 S. Santa Fe Dr., Englewood, Colo. 80110

Filed Nov. 30, 1972, Ser. No. 310,895

Int. Cl. B60r *21/02*

U.S. Cl. 280—150 SB **18 Claims**



1. A vehicle-mounted, passive seat belt assembly comprising:

a. a vehicle seat having

1. a generally horizontally disposed seat portion,
2. a backrest portion, and
3. an inboard seat belt positioning means disposed adjacent one side of said seat portion forwardly of said backrest portion and having a part disposed above said seat portion, said part lying generally in a horizontal plane disposed approximately adjacent the upper surfaces of the legs of a person when seated in said vehicle seat, and

b. a vehicle door disposed adjacent the other side of said seat portion;

c. a first seat belt securing means intercoupled with said vehicle door and lying generally in a horizontal plane disposed immediately adjacent the upper surfaces of the legs of a person when seated in said vehicle seat;

d. a second seat belt securing means disposed inboard of said vehicle seat;

e. a seat belt having

1. a first portion disposed in supporting engagement with said part of said inboard seat belt positioning means,
2. a second portion intercoupled with said first seat belt securing means,
3. a third portion extending between said first and second portions and being disposed uninterrupted in extent and spaced above said seat portion to overlie same continuously for any open and closed position of said vehicle door,
4. a fourth portion disposed in supporting engagement with said second seat belt securing means whereby a part of said fourth portion is disposed adjacent the upper part of the backrest portion of said vehicle seat and in positioning of one shoulder of a person seated in said vehicle seat, and
5. a fifth portion extending between said third portion and the part of said fourth portion and being disposed uninterrupted in extent and spaced generally forwardly of said backrest portion for any open or closed position of said vehicle door;

f. said inboard seat belt positioning means, said first portion of said seat belt and said horizontally disposed seat portion cooperating to provide a generally rectangularly spacing sufficient to receive therein the legs of a person using the seat;

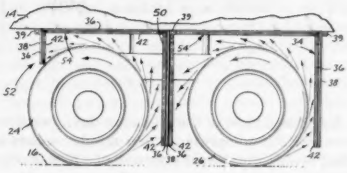
g. means for retracting at least a part of said seat belt upon closing of said vehicle door thereby maintaining a predetermined tautness therealong; and

h. means for preventing movement of said seat belt relative to at least one of said inboard seat positioning means and said first seat belt securing means in response to the application of a predetermined accelerative force applied to a vehicle in which said seat belt assembly is mounted.

3,899,192
SPLASH AND SPRAY REDUCING DEVICE FOR A VEHICLE

Walter W. Reddaway, 405 Ogden Dr., Oregon City, Oreg. 97045

Filed Apr. 19, 1974, Ser. No. 462,370
Int. Cl.[2] B62D *25/16*
U.S. Cl. 280—154.5 R **16 Claims**



1. A device for reducing splash and spray of fluid thrown from the wheels of a vehicle comprising

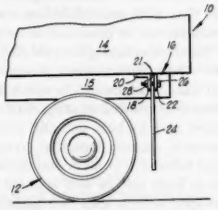
a backing section mounted on such vehicle having a surface expanse facing the periphery of the wheel and

a plurality of elongate elements distributed over a major portion of said expanse and secured at an inner set of their ends to said backing with said inner ends of the elements disposed in laterally spaced rows and remainder portions of said elements projecting outwardly generally in the direction of said wheel in random angular relations to each other and to said surface expanse, with portions of said elements spaced outwardly from said backing disposed in a random tangled mass.

3,899,193
MUD FLAP MOUNTING ASSEMBLY

James P. Evans, 3233 S.W. 23 St., Oklahoma City, Okla. 73128

Filed June 7, 1973, Ser. No. 367,979
Int. Cl. B62d *25/16*
U.S. Cl. 280—154.5 R **2 Claims**



1. An improved mud flap mmounting assembly secured to the underside of trucks, truck trailers or the like and suspended behind the vehicle wheels and constructed for the quick change of mud flaps, the said assembly comprising:

an elongated angular shaped front plate with first side of said front plate secured to said vehicle;

an elongated back plate for lesser width than said front plate;

a hinge structure rotatably connecting one end of said back plate to one end of the second side of said front plate such that said back plate defines an elongated aperture between the upper side of said vehicle and the upper edge of said back plate;

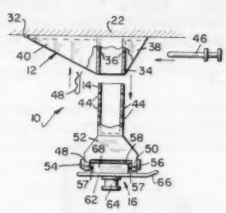
a flexible mud flap having the upper edge of the planar surface of said mud flap extending between said front and back plates frictionally engaged thereby said flexible mud flap having a transverse angularly shaped lip disposed along the upper edge of the planar surface of said flap whereby said lip is disposed in said aperture; and

a securing device connecting the opposite end of the second side of said front plate to the opposite end of said back plate and drawing said front and back plates toward each other and against said mud flap.

3,899,194
ADJUSTABLE LIST PIN BOX

Glenn H. Breford, Holyrood, Kans., assignor to Midway Industries, Inc., Holyrood, Kans.

Filed Mar. 28, 1974, Ser. No. 455,862
Int. Cl. B62d *53/08*
U.S. Cl. 280—438 R **16 Claims**



1. An adjustable list pin box for interconnecting a tractor and a trailer, or the like, comprising:

a. an upper member rigidly secured on the tongue portion of a trailer and having a conduit member with an essentially rectangular cross section extending downward therefrom,

b. a stanchion member having a cross-sectionally rectangular portion slidably mounted in said conduit member, said stanchion member has means to mount a shaft on the lower end portion thereof such that a shaft when mounted will be in position substantially aligning with the longitudinal axis of said trailer, and

c. a hitch engaging member having a shaft mounting means on an upper portion thereof and mounting a shaft, said shaft being mounted with said means to mount a shaft on said stanchion member, said hitch engaging member being constructed and adapted to in use pivot on an axis substantially aligned with the longitudinal axis of said trailer.

3,899,195
FRONT MOUNTED VEHICLE HITCH

Robert C. Rudder, Jr., 2136 McKinley Rd. N.W., Atlanta, Ga. 30318

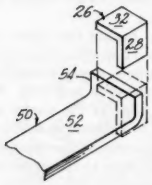
Filed Sept. 10, 1973, Ser. No. 396,079
Int. Cl.[2] B60D *3/00, 1/06*
U.S. Cl. 280—481 **4 Claims**

1. In a front mounted vehicle hitch for an occupant-driven vehicle:

a. an occupant-driven vehicle having a front and having a vehicle frame member extending from said front rearwardly on said vehicle,

b. an elongated hitch bar having a retainer member attached thereto and spaced therefrom defining a space

between said retainer member and hitch bar for receiving said frame member therein whereby said hitch bar is mounted on said vehicle frame member at a position spaced from the front of said vehicle,



c. a mounting plate attached to and projecting away from said bar intermediate the length thereof and spaced from said retainer member thereon, said mounting plate being attached to said frame at another location thereon from said retainer and forwardly of said vehicle therefrom.

3,899,196

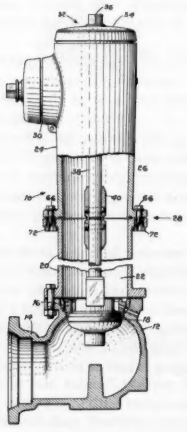
FIRE HYDRANT

James W. Dashner, Elmira, N.Y., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed June 6, 1973, Ser. No. 367,622

Int. Cl.[2] F16L *35/00*

U.S. Cl. 285—2 **11 Claims**



1. A fire hydrant comprising:

a lower standpipe having an outwardly extending flange on an upper end thereof;

an upper standpipe having an outwardly extending flange on a lower end thereof, said flanges having juxtaposed annular surfaces;

connecting means engaging both of said flanges and connecting said standpipes, at least a portion of said connecting means being formed of a frangible material having a tensile strength controlled within a selected range considerably less than that of the standpipes; and

pivot forming means formed on one of said juxtaposed annular surfaces and disposed inwardly of said connecting means for providing a pivot point on an inner portion of the juxtaposed surfaces, whereby said connecting means fractures if the hydrant is struck by a vehicle and the upper standpipe pivots about said pivot forming means at a point on the inner portion of juxtaposed surfaces so that the flanges are not damaged when the upper standpipe breaks away.

3,899,197

CONNECTING ARRANGEMENT FOR CONNECTING TWO VESSELS

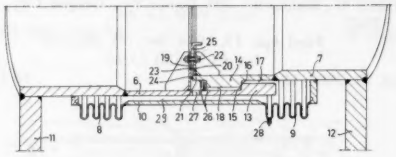
Willi Coenders, and Franz Trockel, both of Essen, Germany, assignors to Heinrich Koppers Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Oct. 25, 1972, Ser. No. 300,623

Claims priority, application Germany, Oct. 26, 1971, 2153225; Feb. 23, 1972, 2208479

Int. Cl. F16l *27/02*

U.S. Cl. 285—14 **4 Claims**

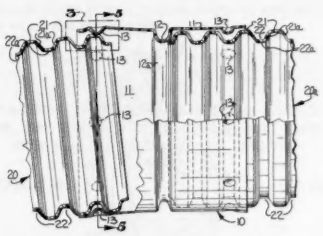


1. An arrangement of the character described for connecting two vessels, comprising a first tubular socket having an axis and two axially spaced ends one of which is connected to and communicates with one vessel; a second tubular socket also having an axis and two axially spaced ends one of which is connected to and communicates with the other vessel; and means for connecting said sockets so as to establish communication between the same, prevent axial displacement thereof away from one another, and compensate for a radial displacement of one of said sockets with respect to the other socket due to differential thermal expansions of the vessels and of the connecting arrangement and due to pressure variations therein, said means including a first tubular member rigidly connected to the free end of one of said sockets and forming a coaxial extension thereof and formed with an external annular projection having a radially extending first shoulder, a second tubular member rigidly connected to the free end of the other socket forming a coaxial extension thereof at least partially surrounding and defining an annular gap with said first tubular member and being formed with an internal annular projection having a radially extending second shoulder cooperating with said first shoulder so as to prevent displacement of said tubular members away from one another while permitting radial displacement thereof with respect to one another, a first bellows member sealingly connected to said first socket, a second bellows member sealingly connected to said second socket, and a connecting sleeve sealingly connected to said first and second bellows members and surrounding with clearance at least said second tubular member and operative for compensating for said radial displacement of said tubular members with respect to one another by tilting relative to said axes, said shoulders subdividing said gap into two gap portions one communicating with the interior of said tubular members and sockets and the other communicating with said clearance, sealing lamellae arranged between said first and second tubular members and operative for shielding said shoulders at least one of said sockets and tubular members being provided with at least one aperture communicating said interior with said clearance whereby a low-resistance flow path is formed for equalizing the pressure in said clearance and in said other gap portion on the one hand with the varying pressure in said interior and said one gap portion on the other hand, at any given instant whereby contamination of said shoulders by the fluid passing through said interior is minimized.

3,899,198
COUPLING FOR INTERCONNECTING CORRUGATED PLASTIC TUBES

Ernest J. Maroschak, P.O. Box 878, Roseboro, N.C. 28382

Filed Apr. 18, 1973, Ser. No. 352,245
Int. Cl.² F16L 47/00
U.S. Cl. 285—27 1 Claim



1. A plastic tube having spaced apart successive annular ribs with annular valley portions therebetween extending along the length thereof and defining annular corrugations on the periphery of the tube and a plastic coupling connected to an end of said plastic tube and in fluid communication therewith, said coupling comprising a generally tubular plastic body including an annular sleeve portion receiving an end of said plastic tube therein, said sleeve portion being tapered outwardly over its entire length to facilitate insertion of said tube therein with the diameter of the sleeve at the outermost end being about 0.001 inch greater than the diameter at the innermost end, said sleeve portion having integrally formed therewith a series of eight spaced apart latching projections circularly arranged in opposing pairs in a single row around the inner circumference of said sleeve portion and extending inwardly into a common valley portion on said tube for engaging the tube and effecting the connection between the coupling and the tube, said latching projections being of hollow construction and substantially hemispherical in shape and having a diameter of no more than about ¼ inch as measured across the base interiorly of the sleeve portion and equal to about one-half the distance between corresponding points on successive ribs of said tube and extending inwardly from said sleeve portion for a distance equal to about one-half the depth of the valley portions between adjacent ribs on said tube, said hollow latching projections also having a wall thickness of less than about one-half of said inwardly projecting distance and being rigid so as to effect displacement of the surrounding adjacent sleeve portion when the tube is inserted in said sleeve portion for facilitating effecting the connection therebetween and to avoid deforming the latching projections, relatively small annular ridges formed integrally with said sleeve portion and located closely adjacent to and on opposite sides of said circularly arranged latching projections, said annular ridges serving to provide additional stability to said sleeve portion and to assist in maintaining the sleeve fully opened for readily receiving the end of said plastic tube therein, and inwardly extending stop means adjacent the innermost end of said sleeve portion for limiting the extent to which the plastic tube may be received in said coupling.

3,899,199
SELF-ALIGNING COUPLING

Robert B. Garey, San Jose, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 23, 1974, Ser. No. 517,116
Int. Cl.² F16L 35/00
U.S. Cl. 285—27 10 Claims

1. A coupling joining openings of a first and second conduit in fluid communication, said coupling comprising:

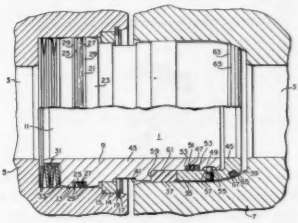
a sleeve having a central bore which registers with said opening in said conduits;

said first conduit having a generally cylindrical counter bore receiving one end of said sleeve,

means for retaining said sleeve in said counter bore in said first conduit,

means for forming a seal between said sleeve and said first counter bore;

said second conduit having a counter bore, which has a generally cylindrical portion and a spherical portion inboard of said cylindrical portion;



said sleeve having a body portion and a nose portion slidably disposed over a portion of said body portion,

means for forming a seal between said body portion and said nose portion,

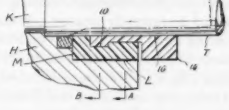
said nose portion having a spherical portion, which seats on said spherical portion in said counter bore in said second conduit, and

means for forming a seal between said nose portion, body portion and said counter bore in said second conduit and for biasing said nose portion towards said spherical portion in the second counter bore.

3,899,200
FLUID CONDUITS

Kenneth H. Gamble, Rugeley, England, assignor to Scovill Manufacturing Company, Waterbury, Conn.

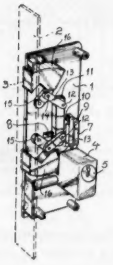
Filed Jan. 3, 1974, Ser. No. 430,588
Claims priority, application United Kingdom, Jan. 5, 1973, 792/73
Int. Cl.² F16L 35/00
U.S. Cl. 285—93 2 Claims



1. For use with a tubular conduit, an assembly including a coupling comprising longitudinally aligned inner and outer members having apertures providing engaging surfaces for the conduit, the aperture in the inner member being a cylindrical, smooth, inwardly-facing surface, the members being both generally cylindrical and relatively rotatable and having interengagement regions eccentric to the axis of the members whereby the tubular conduit received into the apertures can be gripped between the members by relative rotation of the members to cause relative lateral displacement of the apertures of the respective members, at least one radially projecting retaining element on the inner member received into a recess in the outer member inhibiting relative axial movement between the members, the outer member being axially split and dowels and cooperative openings being provided in the

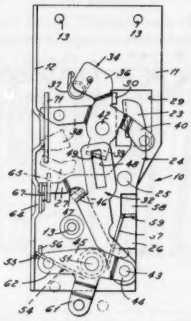
split faces thereof to facilitate assembly; and housing means snugly and peripherally enclosing the outer member in press fit.

3,899,201
LOCK-STRUCTURES
Jose Paioletti, Rua Alagoas No. 270-8° andar, Sao Paulo, Brazil
Filed Dec. 10, 1973, Ser. No. 423,520
Int. Cl. E05b *65/08*
U.S. Cl. 292—25 **5 Claims**



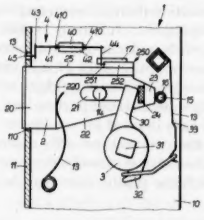
1. A door lock comprising a casing having a pair of spaced substantially parallel sidewalls having longitudinal front edges; a pair of hook-shaped locking members each pivotally mounted in the region of one end thereof on said sidewalls for movement between a retracted position within said casing and a locking position in which said locking members project with portions thereof beyond said longitudinal front edges; means for moving said locking members between the positions thereof and including slide block means and a pair of links pivotally connected to said slide block means and said locking members, said slide block means being provided with a slot extending substantially parallel to said front edges of said sidewalls; cooperating guide means on said slide block means and one of said sidewalls for guiding said slide block means movable toward and away from said front edges; spring biased latch means comprising an elongated latching bar movably guided in said slot between a latching and a releasing position, said latching bar having inwardly extending opposite ends substantially normal to the portion of the bar which is guided in said slot; a single projection protruding from one of said sidewalls arranged to laterally engage one side of one of said inwardly extending ends of said bar when the latter is in said latching position, to prevent said slide block to move toward said longitudinal edges and movement of said locking members from said retracted to said locking position; and rotatable cylinder means mounted in said casing and having a radially extending projection arranged to engage upon rotation of said cylinder means in one direction first the other of said inwardly turned ends of the locking bar to move the latter against the spring bias to said releasing position in which said one inwardly turned end is moved out of lateral engagement with said projection on said sidewall and to subsequently engage the thus freed slide block means to move the latter laterally towards said longitudinal edges and the locking members from said retracted to said locking position, said spring biased means moving back to its latching position after said slide block means has moved laterally so that said one inwardly turned end of said latching bar engages said projection on the sidewall on the other side of the latter to prevent movement of said slide block means in a direction away from said longitudinal edges to thus hold said locking members in said locking position.

3,899,202
AUTOMOTIVE SIDE DOOR LATCH
Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.
Filed Apr. 25, 1973, Ser. No. 354,223
Int. Cl.² E05C *3/28*
U.S. Cl. 292—216 **14 Claims**



1. In an automotive door lock, a fixed mounting plate, a pawl having a fixed pivotal mount to operate on said plate, said pawl having an operating arm, an operating lever similarly mounted by a fixed pivot on said plate, an intermittent operating slide having a fixed pivotal connection to said operating lever to be operated by the latter, a locking lever having a fixed pivot on said mounting plate, said slide having an actuator element engageable with the pawl operating arm to swing the pawl in a latch-releasing direction, the slide having a lost motion overrunning connection with a part of the locking lever and being engaged at said last-named connection by said locking lever part to shift the slide to a position in which its actuator element fails to engage said pawl operator arm, and spring means acting directly on and between a fixed part of said mounting plate and a part fixed on said pawl, said spring means strongly biasing said pawl about its pivotal plate mount in a latch-releasing direction.

3,899,203
DOOR LOCK
Walter Helmut Heitz, Hoher Holzweg 22, Arnum, Germany
Filed May 9, 1973, Ser. No. 358,739
Claims priority, application Germany, May 19, 1972, 2224521
Int. Cl.² E05C *1/06*
U.S. Cl. 292—335 **22 Claims**



1. A door lock, for a door having a door frame, comprising in combination,
a spring-loaded retractable latch,
a bolt movable to and from a locking position for arresting said latch in retracted position,
a release member carried by the door and movable between active and inactive positions and operative to engage the bolt to move the bolt to its locking position when the

release member is moved to its inactive position and, respectively, to release the bolt for movement from its locking position when the release member is moved to its active position,

a contact piece positioned on said door frame for engaging said release member to move it to its active position when said door is being shut, and

means operable for adjusting the position of said release member with relation to the door, thereby adjusting the relative position of said release member and said contact piece when the door is shut.

3,899,204

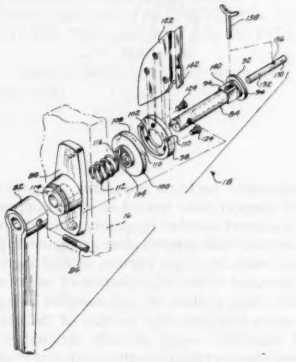
WASHING MACHINE AND DOOR LATCH

Carl Ulrich, 244 Whitehall St., Lynbrook, N.Y. 11563

Filed Sept. 26, 1973, Ser. No. 400,799

Int. Cl. E05c *3/04*

U.S. Cl. 292—336.3 **18 Claims**



1. A safety door latch for selectively maintaining a door in a closed position with respect to a fixed frame comprising, a handle rotatably mounted on said door, a first latch member mounted on said frame adjacent said handle, a second latch member adapted to engage and cooperate with said first latch member, selectively operable and normally engaged clutch means for operatively connecting said second latch member to said handle for rotation with said handle when said clutch is engaged, whereby when said door is closed rotation of said handle places said second latch member in latching engagement with said first latch member; and means for selectively disengaging said clutch when said first and second latching members are in latching engagement whereby further rotation of said handle is ineffective to rotate said second latch member and said door is held in its closed position; said handle including a shaft rigidly connected thereto for rotation therewith; and said clutch means including a pair of clutch plates, one of said clutch plates being mounted on said shaft for rotation therewith and the other of said clutch plates being freely rotatably mounted on said shaft, said second latching member being secured to said other clutch plate whereby when said clutch plates are in operative engagement, rotation of said handle rotates said second latching member and when said clutch plates are disengaged, said handle and shaft rotate freely with respect to said second latching member.

3,899,205

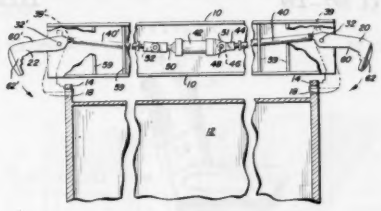
CONTAINER RETRIEVAL SYSTEM

John J. Lanigan, Tinley Park; Myron Glickman, Des Plaines, and Anthony H. Hehn, Skokie, all of Ill., assignors to Mi-Jack Products, Inc., Hazel Crest, Ill.

Filed Aug. 13, 1973, Ser. No. 387,734

Int. Cl. B66c *1/66*

U.S. Cl. 294—81 R **2 Claims**



1. In a device for lifting large containers for placement upon and from a railroad car wherein the containers have coaxial openings on opposite sides of the container adjacent a top corner thereof; the improvement comprising, in combination: an elongated frame having a length that is at least as long as the distance between said opposite sides of the container to be lifted; a first lifting arm comprising a shank portion and a shoe portion extending at an angle from said shank portion, a second lifting arm comprising a shank portion and a shoe portion extending at an angle from said last mentioned shank portion; said shoe portions being stepped with the steps rising toward said shank portions and with the tops of the steps being planar to provide load bearing surfaces; means pivotally connecting said first and second lifting arms to said frame with the shoe portion of said first and second lifting arm being directed toward the shoe portion of said second lifting arm and with the pivotal axes of said lifting arms being generally parallel to each other and generally perpendicular to the longitudinal axis of said frame; means carried by said frame for pivoting said lifting arms from (a) an unlatched position wherein said shoe portions are spaced apart a distance that is greater than the distance between said opposite sides of the container to be lifted and (b) a latched position wherein said shoe portions are spaced apart a distance that is less than the distance between said opposite sides of the container to be lifted; and remote control means coupled to said lifting arms' pivoting means.

3,899,206

ENDLESS ROPE SLING

Kitie Miura, No. 51 Higashi-Oyashiki, Katahari-machi, Gamagoori, Japan

Filed Nov. 12, 1973, Ser. No. 414,719

Claims priority, application Japan, Nov. 14, 1972, 47-114524; Nov. 14, 1972, 47-114525; Nov. 14, 1972, 47-114526; Nov. 14, 1972, 47-114527

Int. Cl.[2] B66C *1/12*

U.S. Cl. 294—74 **7 Claims**

1. An endless rope sling comprising:

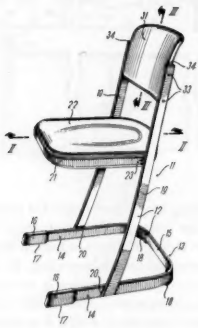
a core including a plurality of substantially concentric layers which are consecutively braided from continuous filament yarns in a manner to cover one with another; and

a sheath including at least one substantially concentric layer which is consecutively braided from said continuous filament yarns in a manner to cover the outermost layer of said core.

3,899,207
CHAIRS

Falk Müeller, Tauberbischofsheim, Germany, assignor to VS-Schulmoebel Verwaltungs-GmbH, Germany

Filed Dec. 28, 1973, Ser. No. 429,626
Claims priority, application Germany, Dec. 20, 1972, 465033[U]
Int. Cl.[2] A47C 3/04
U.S. Cl. 297—239 23 Claims

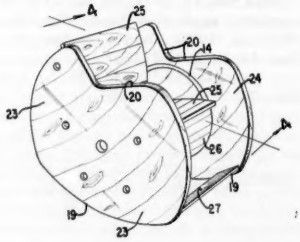


1. A stackable chair comprising:
a. a continuous U-shaped metal base having a pair of substantially parallel runners, said U-shaped base being open toward the front of the chair;
b. a pair of lateral supports attached to the outer sides of the central portions of said runners and sloping upwardly towards the rear of the chair;
c. a U-shaped metal seat support attached to said lateral supports, said seat support being open toward the rear of the chair;
d. a seat attached to and peripherally surrounded by said seat support; and
e. a back rest attached to said lateral supports above said seat support.

3,899,208
CHAIR AND METHOD OF MAKING A CHAIR

Charles F. Cirigliano, RFD, Cornwall Bridge, Conn. 06754

Filed June 13, 1974, Ser. No. 478,946
Int. Cl.[2] A47C 3/02
U.S. Cl. 297—258 5 Claims

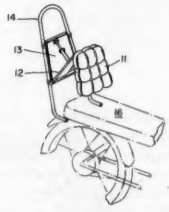


1. A chair including a planar, right-hand side member having apertures therethrough and channel means comprising a circularly arcuate hub channel and a seat channel in a surface thereof, a planar left-hand side member comprising the mirror image of said right-hand side member wherein said side members are disposed in parallel, facing relationship, a seat portion for forming a seating surface comprising a first plurality of slats, each having ends disposed in said seat channels, a support portion for further supporting said side members comprising a second plurality of slats, each having ends disposed in said hub channels wherein access to said seating surface is unobstructed, and a plurality of tension bolt means for urging said side members together, each spanning said side members and extending through corresponding apertures and wherein access to said seating surface is unobstructed by said tension bolt means.

3,899,209
ADJUSTABLE MOTORCYCLE BACKREST

Richard H. Schulz, 845 N. L St., Livermore, Calif. 94550

Filed May 17, 1974, Ser. No. 471,037
Int. Cl.[2] B60N 1/02
U.S. Cl. 297—383 8 Claims

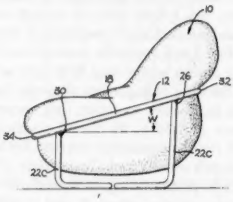


1. An adjustable backrest apparatus comprising a base plate, a back support plate spaced apart and opposed to said base plate, a support member hingeably secured between said base plate and said back support plate and extending obliquely therebetween with one edge portion of said member being pivotally connected to one edge portion of one of said plates and the other edge portion of said member being pivotally connected to an opposite edge portion of the other of said plates, and extension means pivotally secured to a medial portion of said support member and extending from opposite sides thereof to said base plate and to said back support plate and hingeably connected to each of said plates to the opposite edge portions from their connections to said member for selectively varying the spacing and angular orientation between.

3,899,210
BEAN-BAG CHAIR

Clair A. Samhammer, Orange, and Steven N. Lederman, Los Angeles, both of Calif., assignors to Lederman's Incorporated, Los Angeles, Calif.

Filed June 1, 1973, Ser. No. 366,067
Int. Cl.[2] A47C 07/02, 01/12
U.S. Cl. 297—445 7 Claims



1. A bean-bag chair comprised of:
a. a bean-bag assembly comprising a fully enclosed bag having a unitary interior volume, each portion of said volume freely communicating with every other portion thereof, and a plurality of resilient flowable pellets con-

tained within and partially filling said bag, said pellets being made of expandable polystyrene foam;

b. a supporting structure comprising a circumferential rim affixed to at least one base member disposed beneath it, said rim defining an interior space whose dimensions are sufficiently less than the corresponding dimensions of said bean-bag assembly, such that said rim supports said bean-bag assembly and substantially constrains the outward expansion thereof,

whereby said bean-bag assembly is elevated above the floor at a level which is normal for sitting in a chair, and said pellets are displaced in a generally upward direction within said interior volume of said bag when said bag is subjected to the weight of a person sitting thereon.

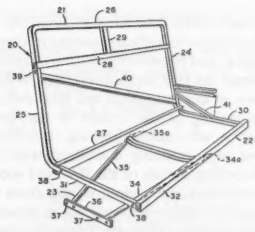
3,899,211
CANTILEVERED SEAT FOR MOTORCOACH VEHICLES OR THE LIKE

Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.

Continuation-in-part of Ser. No. 211,423, Dec. 23, 1971, Pat. No. 3,747,979. This application July 19, 1973, Ser. No. 380,699

Int. Cl. A47c *7/02, 7/00;* **B60n** *1/00*

U.S. Cl. 297—451 **13 Claims**



1. In a multi-passenger seat for a vehicle, said seat having at least three sections, the combination comprising a generally vertical back frame and a generally horizontal seat frame said back and seat frames having at least three sections including wall, middle and aisle seating sections, said seat frame having at least two elongated horizontal stretcher members and cross frame means interconnecting said stretcher members at laterally spaced locations to form a rigid structure; an inclined truss frame located beneath said horizontal stretcher members and including forward and rear inclined truss frame members attached at their upper ends to said stretcher members respectively and inclined downwardly from said attachments in generally the same direction as said stretcher members; means for mounting the wall ends of said stretcher members and the lower ends of said inclined truss frame members to the wall of said vehicle at a location above the floor; means for mounting said back frame to the wall of said vehicle; and diagonal strut means across at least a portion of said back frame at said wall and middle sections and across at least a portion of the back frame at said aisle seating section, said seat being characterized in their being no connection between said seat and the floor of the vehicle.

3,899,212
DIVIDING CUTTING MACHINE HAVING MEANS FOR ROTATING THE JIB ARM

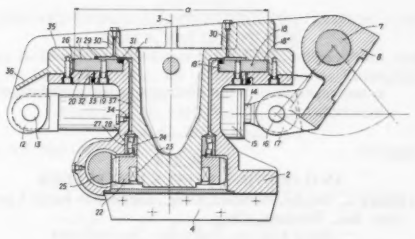
Siegfried Sigott, and Hubert Schwelberger, both of Zeltweg, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft

Filed June 28, 1973, Ser. No. 374,387

Claims priority, application Austria, June 30, 1972, 5642/72

Int. Cl.² E21C *27/00*

U.S. Cl. 299—75 **10 Claims**



1. A dividing cutting machine which comprises:

a. a frame,

b. a bracket rigidly connected to said frame,

c. a swivel head,

d. separate radial and thrust bearing means by which said swivel head is mounted in said bracket for rotation about an approximately vertical axis of rotation, said thrust bearing means for taking up only axial loads in opposite directions and having an effective diameter which exceeds the diameter of the radial bearing means, and said radial bearing means being spaced from said thrust bearing means in an axial direction,

e. said thrust bearing means including (i) a plane annular bearing disc having inner and outer annular zones, said bearing disc being rigidly connected on one side in said inner annular zone with one of the parts consisting of said bracket and swivel head, and (ii) two axially spaced apart confronting parallel plane sliding surfaces formed on the other of said parts consisting of said bracket and swivel head, said outer annular zone of said disc being disposed between and guided by said sliding surfaces, and

f. a jib arm which is mounted in said swivel head for rotation about a swivel axis which crosses said axis of rotation approximately at right angles.

3,899,213
AIRBORNE LASER REMOTE SENSING SYSTEM FOR THE DETECTION AND IDENTIFICATION OF OIL SPILLS

John F. Fantasia, Newton, and Hector C. Ingrao, Wellesley, both of Mass., assignors to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed Mar. 8, 1974, Ser. No. 449,327

Int. Cl.² G01T *1/169;* **G01N** *21/38*

U.S. Cl. 250—301 **8 Claims**

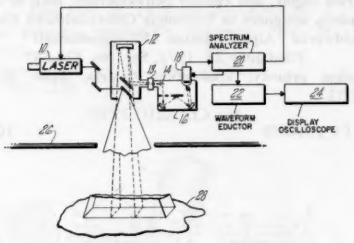
1. A method for the classification of materials from a remote location comprising the steps of:

directing high energy pulses of artificial light onto the material to be classified to cause the material to fluoresce;

separating the resulting fluorescent energy into its electromagnetic frequency spectrum;

incrementally scanning at least a portion of the fluorescence spectrum to provide signals commensurate with the magnitude of the energy comprising frequency bands of preselected width; and

combining the results of the incremental scanning of the fluorescence spectrum to provide an output waveform



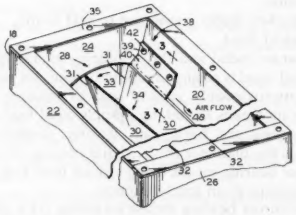
commensurate with the distinct spectral signature of the material.

3,899,214

ANTI-DUSTING BAFFLE FOR FEEDER

Clifford L. Stupfel, Portland, Oreg., assignor to Rader Companies, Inc., Portland, Oreg.

Filed Apr. 27, 1973, Ser. No. 354,993
Int. Cl. B65g *53/40*
U.S. Cl. 302—49 **6 Claims**



1. A rotary feeder for feeding material from a supply bin into a pressurized gas pipeline comprising:

a rotor housing communicating with said bin and said pipeline,

a rotor cylinder mounted in said housing and having a plurality of helical blades mounted thereon, each of said blades having a leading and trailing edge, said blades defining rotor pockets which carry material from said bin to said pipeline during rotation of said blades,

and baffle means provided on said housing adjacent to and along a relatively short distance of the leading edges only of said helical blades for diverting gas trapped in said pockets, said baffle means directing said trapped gas substantially horizontally toward said trailing edges and then releasing said gas for upward motion as said pockets open into said bin thereby preventing interference with the filling of said pockets with the material in said bin.

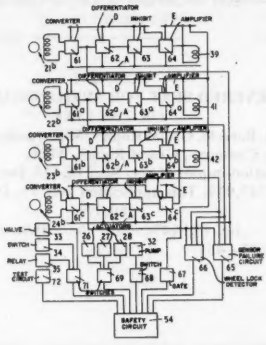
3,899,215

ROAD VEHICLE BRAKING SYSTEM INCORPORATING WHEEL SLIDE PROTECTION

Christopher John Sutton, Belgrave, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed July 10, 1973, Ser. No. 377,966
Claims priority, application United Kingdom, July 14, 1972, 32985/72
Int. Cl.[2] B60T *8/08*
U.S. Cl. 303—21 AF **3 Claims**

1. A road vehicle braking system incorporating wheel slide protection, comprising in combination first and second sensors associated respectively with first and second wheels of the vehicle and producing first and second a.c. signals at frequencies dependent on the rotational speeds of the first and second vehicle wheels respectively, first and second frequency to voltage converters for producing from said first and second a.c. signals first and second d.c. signals dependent on said rotational speeds of the first and second vehicle wheels respectively, first and second differentiating circuits to which the first and second d.c. signals are fed respectively, the differentiating circuits producing output signals dependent on the rotational decelerations of the first and second wheels, means operable by way of the output signals from the first and second differentiating circuits for releasing the brakes applied to the



first and second wheels respectively, when the output signals from the first and second differentiating circuits exceed predetermined values, and monitoring means operable to compare the outputs from the first and second sensors and in the event of a difference in the outputs of the first and second sensors to prevent releasing of the brakes of the first and second wheels during a subsequent braking operation, the output signals of the sensors being compared with each other by sampling the output signals of the first and second frequency to voltage converters, the output signals from the converters being applied to a bridge network which produces an output when the output signals from the converters are not equal.

3,899,216

BRAKING SYSTEM FOR A MULTI-CAR VEHICLE

Thomas H. Putman, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 28, 1974, Ser. No. 437,449
Int. Cl.[2] B60T *8/14*
U.S. Cl. 303—21 A **8 Claims**

1. In apparatus for controlling the application of brakes on one car of a coupled multi-car vehicle, the combination comprising:

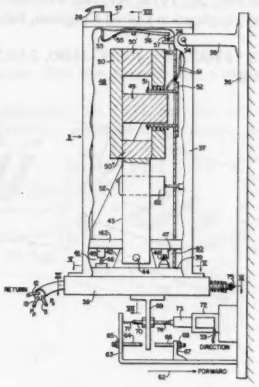
valve means, including first and second valves;

means for causing said second and first valves to move towards one valve condition and the opposite valve condition respectively in response to a sensed deceleration when said vehicle is moving in one direction, and for causing said second and first valves to move towards said opposite valve condition and one valve condition respectively in response to a sensed deceleration when said vehicle is moving in the opposite direction;

means for applying the brakes on said one car in response to said first valve being in said one condition when said vehicle moves in said one direction and in response to said second valve being in said one condition when said vehicle moves in said opposite direction;

means for sensing the coupling forces acting on at least one end of said one car; and

means for releasing the brakes on said one car if the sensed coupling forces tend to accelerate said one car, and for



applying the brakes on said one car if the sensed coupling forces tend to decelerate said one car.

3,899,217

HYDRAULIC BRAKE PRESSURE CONTROL VALVE UNIT

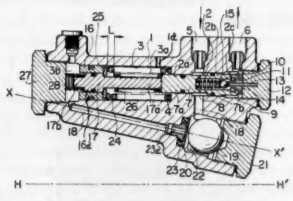
Yoshimoto Ohta, Kawasaki, Japan, assignor to Tokico Limited, Japan

Filed Oct. 9, 1973, Ser. No. 404,740

Claims priority, application Japan, Oct. 9, 1972, 47-101286; July 6, 1973, 48-76337

Int. Cl. B60t *8/14*

U.S. Cl. 303—24 C **4 Claims**



1. A pressure control valve unit for insertion in a brake system extending from a hydraulic pressure source, comprising in combination:

a. a main valve housing having a liquid flow passage formed therein, one end of said flow passage being connected through part of said brake system to said pressure source and the other end of said flow passage being connected to said rear wheel cylinders;

b. a control chamber formed in said main valve housing and being fluidally separated from said flow passage;

c. a piston, one end thereof being fitted with a valve member adapted for on-off control of said fluid passage, one end of said piston being exposed to said liquid flow passage and the other end of said piston being exposed to said control chamber;

d. a tightly movable separating wall fitted in said control chamber;

e. a liquid pressure conveying means adapted for conveying liquid pressure prevailing in said liquid flow passage to one side of said movable separating wall and to said piston end exposed to said liquid flow passage;

f. an inertia valve adapted for interruption of said liquid pressure conveying means upon establishment of a predetermined deceleration of said vehicle;

g. a first spring arranged between said valve housing and said movable separating wall, said spring becoming effective upon movement of said separating wall; and

h. a second spring arranged between said movable separating wall and said piston which becomes effective only after lapse of a predetermined time period upon initiation of the movement of either said separating wall or said piston or both.

3,899,218

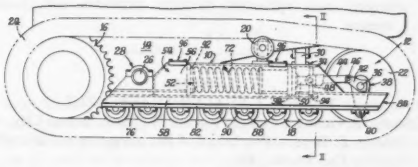
COMBINED INTEGRAL COMPONENT ENCLOSURE AND TRACK ROLLER FRAME

Gary D. Blomstrom, Metamora; Lindell L. Miller, Plano, and Lyle E. York, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 26, 1973, Ser. No. 428,092

Int. Cl. B62d *55/30*

U.S. Cl. 305—9 **5 Claims**



1. A combined integral component enclosure and track roller frame, for a track-type vehicle supported thereon by a plurality of rollers mounted on the frame, with an endless track chain peripherally engaged with the rollers, and with a recoil mechanism applying tension to the track chain, comprising;

an elongated inverted U-shaped housing having a tunnel forming bight portion and a pair of spaced leg portions; elongated roller mounting means including a pair of symmetrically oppositely outwardly facing L-shaped angle members and additional connector wall members individually secured to their respectively adjacent angled members in outwardly extended channular forming relationship therewith for attachment to said leg portions of the housing forming therewith a pair of substantially parallel fully enclosed box beams; and

an elongated cross-plate disposed within said housing substantially horizontally between said box beams to form a tunnel-like enclosure which contains and protects such recoil mechanism while also providing a track roller frame having maximum strength and resistance to distortion.

3,899,219

SELF-CLEANING SPROCKET MEANS

Roger L. Boggs, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 28, 1974, Ser. No. 474,002

Int. Cl.² B60S *1/62*

U.S. Cl. 305—13 **5 Claims**

1. A tractor having a sprocket member and an endless traction chain cooperatively engaged with said sprocket member, said sprocket member comprising

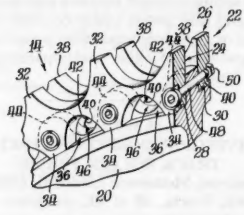
a sprocket hub;

sprocket tooth defining means defining a plurality of spaced-apart first flanges defining a plurality of first open portions;

the sprocket hub defining a plurality of spaced-apart second flanges defining a plurality of second open portions, said sprocket tooth defining means being positionable relative to said sprocket hub so that said second open portions are

positioned adjacent said first open portions and communicate therewith; and

means for detachably securingly interconnecting said sprocket tooth defining means relative to said sprocket



hub with the second open portions in communication with the first open portions;

whereby said sprocket member provides self-cleaning means.

3,899,220

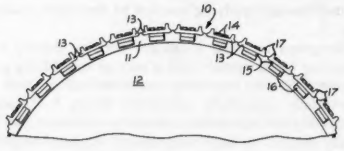
FLEXIBLE SEALED TRACK BELT

Charles E. Grawey, Peoria; Robert W. Untz, Hanna City, and Marvin E. Beyers, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 282,707, Aug. 22, 1972, abandoned. This application Feb. 19, 1974, Ser. No. 443,405

Int. Cl. B60c *27/20*

U.S. Cl. 305—19 **20 Claims**



1. A sealed track belt for use around circular pneumatic carcasses comprising:

an integrally cured cylindrical elastomer belt means having at least one cylindrical reinforcing ply centrally located therein so integral inner and outer elastomer layers respectively cover the inner and outer cylindrical surfaces of said cylindrical reinforcing ply, said reinforcing ply being substantially inextensible and said outer elastomer layer having a plurality of permanently formed rectangular flat track shoe sites having a flat surface oriented transversely to said belt means surface and disposed circumferentially about its outer circular periphery whereby its outer circular periphery has a polygonal configuration when the inner diameter of said belt means is in a circular configuration;

a plurality of rectangular track shoes, having an underside surface substantially mating with the flat surface of said flat track shoe sites, one of said track shoes disposed transversely to said cylindrical reinforcing ply on each of said flat track shoe sites;

a plurality of keeper bars, one of said keeper bars disposed under each track shoe so said cylindrical reinforcing ply is between said track shoe and said keeper bar; and

attaching means connecting each track shoe with its keeper bar so said elastomer belt means is clamped therebetween.

3,899,221

THRUST BEARINGS

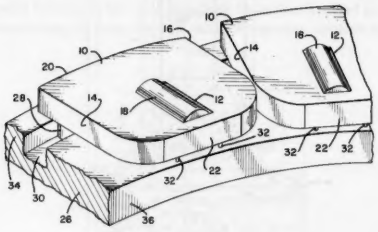
Robert Stanley Batt, Barby, England, assignor to The Torrington Company, Limited, Coventry, England

Filed Feb. 26, 1974, Ser. No. 445,958

Claims priority, application United Kingdom, Feb. 28, 1973, 9797/73

Int. Cl.² F16C *5/00, 17/00, 21/00, 23/02*

U.S. Cl. 308—3 R **14 Claims**



1. Apparatus for use in a thrust bearing comprising: an annular race; a plurality of individual rolling member carriers arranged to move along said race; a single pocket formed in each carrier; a rolling member located in said pocket; and means for preventing rotation of each carrier about its own center in its movement along said race.

3,899,222

HYDROSTATIC BEARING

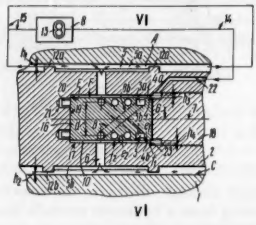
Yakov Idelevich Mendelevsky, prospekt Lenina, 39/1, kv. 9, Vilnjus; Mikhail Efimovich Vaistub, ulitsa Krasny Kazanets, 7, kv. 83, Moscow, and Vilis Yanovich Eglitis, ulitsa Vilnyaus, 18, kv. 40, Vilnjus, Salininkai, all of U.S.S.R.

Filed May 18, 1973, Ser. No. 361,848

Claims priority, application U.S.S.R., June 2, 1971, 1672656; June 6, 1972, 1788751

Int. Cl. F16c *17/00*

U.S. Cl. 308—5 R **7 Claims**



1. A fluid-bearing comprising in combination first and second machine parts, the second machine part projecting axially through said first part for relative rotation therein; and cooperating means on said parts forming a fluid-bearing between the parts when pressurized fluid is circulated therebetween, said means comprising:

a plurality of bearing chambers about said second part,

a plurality of fluid inlet recesses about said second part, each defining with a respective bearing chamber,

cooperating pairs of recesses and chambers disposed in diametrically opposed relation to the longitudinal axis of the second part,

the second part including an axial bore,

an insert element in said axial bore and including circumferential channel portions in the outer surface thereof, helically disposed about the insert element, and forming with

the bore pressure fluid conducting passages connecting the respective pairs of recesses and chambers whereby an increased supporting capacity for the fluid bearing is provided.

3,899,223

MAGNETIC BEARING

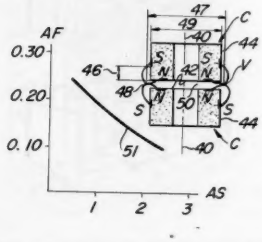
Max Baermann, 506 Bensberg Bezirk, Cologne, Rhine, Germany

Filed Nov. 18, 1971, Ser. No. 200,136

Claims priority, application Germany, Jan. 27, 1971, 2103737

Int. Cl.[2] F16C *32/04*

U.S. Cl. 308—10 **8 Claims**



1. A magnetic suspension bearing comprising; a pair of permanent magnets, each of said magnets having a substantially flat circular end surface and a substantially cylindrical peripheral surface intersecting said end surface at an outer peripheral edge having a peripheral edge diameter, each of said magnets being magnetized to have a pair of spaced-apart magnetic poles of opposite polarity including one magnetic pole on said end surface thereof and an opposite magnetic pole on said peripheral surface thereof, each of said magnets having a longitudinal axis and being positioned in vertically spaced relationship with said longitudinal axes extending vertically and said end surfaces facing one another in substantially parallel spaced-apart relationship to define a facing space therebetween within said peripheral edges of said pair of magnets, each of said magnetic poles on each of said magnets being directly exposed to a non-magnetic material, said pair of poles on each of said magnets having lines of magnetic flux extending therebetween outside of said magnet, said pair of poles on each of said magnets being located relative to said peripheral edge to have said lines of magnetic flux extending into said facing space and outwardly of said facing space beyond said peripheral edge so that said lines of magnetic flux from said pair of magnets interact with one another outwardly of said facing space and said peripheral edges of said magnets at a circular vertex having a diameter substantially larger than said peripheral edge diameter and lying in a plane substantially parallel to said end surfaces and intermediate said end surfaces.

3,899,224

LUBRICATED JOURNAL BEARING

Fredrick T. Schuller, and Warren A. Moore, both of Cleveland, Ohio, assignors to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Division of Ser. No. 346,483, March 30, 1973, Pat. No. 3,830,552, which is a division of Ser. No. 238,264, March 27, 1972, Pat. No. 3,804,472. This application Oct. 11, 1973, Ser. No. 405,346

Int. Cl. F16c *1/24, 1/26, 33/66*

U.S. Cl. 308—121 **9 Claims**

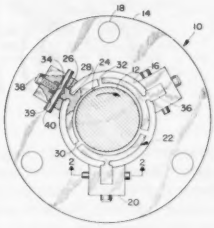
1. In combination with a lightly loaded shaft rotating at high speed having a film of lubricants thereon, an improved bearing comprising

a housing having a bore extending therethrough for receiving said shaft,

a plurality of flexible sectors positioned around said shaft for shaping the geometry of said film, each of said sectors having a first surface facing said shaft and spaced therefrom varying distances so that the film geometry converges, each of said sectors having a second surface directed away from said shaft and spaced from said bore, each of said sectors comprising

a base, and

a pad portion mounted on said base at a junction, said pad portion forming said first surface facing said shaft and



said second surface directed away from said shaft, said pad portion having a trailing edge at the end thereof in the direction of rotation of said shaft and a leading edge at the end in the direction opposite the rotation of said shaft, the minimum radial clearance between said pad portion and said shaft being adjacent to said trailing edge, said pad portion having a tapered thickness for providing a variable film geometry, and

means for rigidly securing said bases to said housing thereby maintaining said sectors about said shaft.

3,899,225

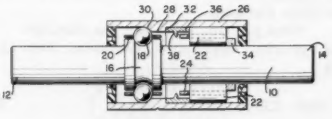
RADIAL AND THRUST BEARING

J. Russell Elmore, New Hartford, and Carl F. Benson, Torrington, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Division of Ser. No. 311,302, Dec. 1, 1972, Pat. No. 3,795,960. This application Nov. 29, 1973, Ser. No. 420,013

Int. Cl. F16c *19/04*

U.S. Cl. 308—174 **7 Claims**

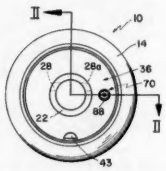


1. In combination: a rotatable shaft shaped to provide a ball inner race and at least one roller inner race adjacent the ball race; a coaxial unitary member having an annular protrusion extending toward the shaft, said annular protrusion having a curved shoulder on one axial side and a substantially straight shoulder on its other axial side, the curved shoulder providing the ball outer race, and at least a portion of the inside perimeter of the unitary member providing the roller outer race; balls positioned in the ball races; rollers positioned in the roller races; and a thrust collar fixedly mounted about the shaft adjacent the axial outer ends of the rollers, and thrust transmitting means including at least the thrust collar and further including a member bearing directly against the substantially straight shoulder for transmitting thrust from the shaft and against the substantially straight shoulder.

3,899,226
BEARING ASSEMBLY

Ruben E. Frost, Grand Rapids, and Douglas J. Van Der Meulen, Martin, both of Mich., assignors to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed May 29, 1973, Ser. No. 364,889
Int. Cl. F16c *1/24*
U.S. Cl. 308—187.1 15 Claims

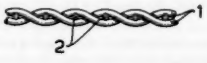


1. A roller bearing assembly comprising, in combination: an inner and outer race; bearing means between said races; sealing means to retain lubrication at said bearing means, said sealing means having an outer sealing ring fixed to one of said races, said outer sealing ring having a radial edge thereof extending to or in close proximity to the other of said races, an inner sealing ring fixed to said other race and having a radial edge thereof extending toward said one race, said radially extending portions of said sealing rings being spaced axially from each other said sealing rings forming at least one trough for collecting particles or the like and drain means to drain such particles or the like from said trough; and lubricating injection means comprising an adapter having a lubricating passageway formed axially therethrough, said adapter being positioned axially through said outer sealing ring whereby lubricating fluid is introduced through said adapter directly into said bearing means intermediate said outer and inner race through said axial sealing means.

3,899,227
METAL LINING

Friedrich Harig, Willich, Germany, assignor to Firma Pampus KG, Willich, Germany

Filed Jan. 16, 1973, Ser. No. 324,184
Claims priority, application Germany, Feb. 3, 1972, 2205008
Int. Cl. F16c *33/28*
U.S. Cl. 308—237 R 5 Claims



1. In a lining, for use in bearing bushings, having a woven fabric of metal wires and a synthetic plastic layer sintered thereon,

the improvement comprising

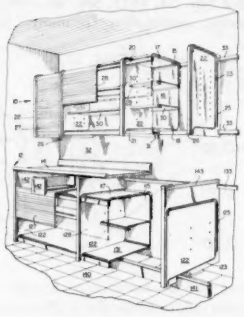
at least a portion of at least some of the intersecting areas of said wires having been welded together and

the fabric having been flattened by rolling after the welding.

3,899,228
STORAGE UNITS

Victor M. Schreiber, 63 Prospect St., Westmount, Montreal, Canada

Filed Sept. 24, 1973, Ser. No. 399,896
Claims priority, application United Kingdom, Sept. 23, 1972, 44121/72
Int. Cl.[2] A47B *47/04*
U.S. Cl. 312—257 R 4 Claims



1. An article of furniture comprising:

a. at least two rigid vertical wall members;

b. means defining a substantially U-shaped slot extending through the entire thickness of each of said wall members;

c. a channel-shaped member formed from one piece of sheet material, said channel-shaped member having a substantially U-shaped cross-section corresponding to the shapes of said slots so as to extend through said slots and having an open side vertical and facing forwardly from said article of furniture; and

d. closure means secured to said article, said closure means being movable between a closed position, in which said closure means closes the open side of said channel-shaped member, and an open position, in which said closure means leaves said open side of said channel-shaped member open.

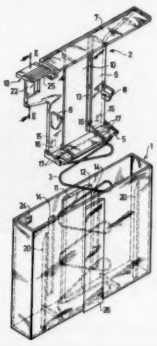
3,899,229
CONTAINER FOR TAPE CASSETTES

Peter Ackeret, Kusnacht, Switzerland, assignor to IDN Inventions and Development of Novelties AG, Lenzerheide, Switzerland

Filed Aug. 27, 1973, Ser. No. 391,962
Claims priority, application Switzerland, Sept. 6, 1972, 013065/72
Int. Cl. A47b *88/00*
U.S. Cl. 312—319 42 Claims

1. A container for a tape cassette, the container comprising a case with an open front, a cassette-carrying slide mounted in the case for sliding movement between an outer, open position in which a cassette can be placed upon or withdrawn from the slide and an inner closed position, the slide being open sided and including a base plate having an upper, cassette-supporting surface and having front portions adjacent the open front of the case, means retaining a tape cassette on the base plate, a spring continuously biasing the slide towards the open position, stop means defining the open position and restraining further movement of the slide out of the case, and releasable catch means movable between a locking position for holding the slide in the closed position and a release position permitting the slide to move outwardly through the open end of the case into the open position under the influence of the spring; the slide having open and unobstructed space at the open sides thereof and adjacent the front portion of the

base plate to entirely expose edges of a cassette supported on the base plate so that a cassette supported on the base plate



can be securely grasped by its exposed side edges and removed therefrom.

3,899,230

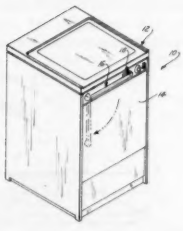
LOCK ASSEMBLY

Richard L. Conrath, and Robert B. Beare, both of Herrin, Ill., assignors to Fedders Corporation, Edison, N.J.

Filed July 11, 1974, Ser. No. 487,465

Int. Cl.[2] E05B *15/02;* **A47B** *88/00*

U.S. Cl. 312—319 **14 Claims**



1. A lock assembly for retaining in a preselected orientation a handle rotatable in a plane substantially parallel to a wall of a cabinet and having a free end movable toward and away from the cabinet, said lock assembly comprising: first locking means adapted to be mounted on one of the cabinet and the free end of the handle, and mating second locking means adapted to be mounted on the other of the cabinet and the free end of the handle, said first locking means comprising a first retaining element, said second locking means comprising a second retaining element engageable with said first retaining element to prevent movement of the free end of the handle away from the cabinet and to retain the handle in said preselected orientation, and latch means adapted to be mounted on the free end of the handle and the cabinet and being operable when said first and second retaining elements are in engagement for arresting rotation of the handle to prevent separation of said first and second retaining elements.

3,899,231

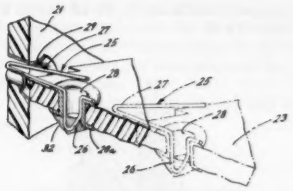
ELECTRICAL CONNECTOR

Ralph Bray, Philadelphia, Pa., assignor to Aeronutronic Ford Corporation, Blue Bell, Pa.

Filed Dec. 21, 1973, Ser. No. 427,080

Int. Cl.[2] H05K *1/02*

U.S. Cl. 339—17 LC **4 Claims**



1. The combination of an electrical connector with at least a pair of adjacently disposed substantially perpendicular electrical circuit-breaking panel structures, comprising: a resilient wire formed with a reversely bent first portion disposed in a first plane, and a reversely bent second end portion disposed in a second plane extending substantially at right angles to the first plane; the reversely bent first end portion projecting into an aperture provided in a first circuit bearing panel with said second plane adjacent and substantially parallel to said first panel, said first end portion being both electrically and mechanically affixed to an adjacent circuit on the panel; and the reversely bent second end portion extending through and residing in resilient engagement with electrically conductive side walls of an aperture provided on said second wiring circuit panel, said electrically conductive side walls comprising electrical terminal means for a circuit on said second panel.

3,899,232

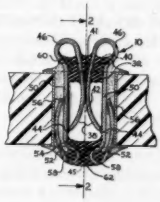
CIRCUIT BOARD SOCKET

Quentin Berg, deceased, late of New Cumberland, Pa.; by Francis H. Berg, co-executor, and Dauphin Deposit Trust Co., co-executor, both of New Cumberland, Pa., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Feb. 4, 1974, Ser. No. 439,622

Int. Cl. H01r *11/22;* **H05k** *1/02*

U.S. Cl. 339—17 C **8 Claims**



7. A circuit board socket comprising an elongate generally cylindrical hollow metal body open at both ends; at least a pair of lead contact fingers extending into the body from one end thereof for forming an electrical connection with the lead inserted into the interior of the body through one end of the body; means for mounting the body in a circuit board hole; and penetrable sealing means completely closing each end of the body to prevent flux or molten solder from flowing into the interior of the body.

3,899,233
CONTACT HEAD FOR ELECTRICALLY MONITORING A PLURALITY OF POINTS IN A CIRCUIT

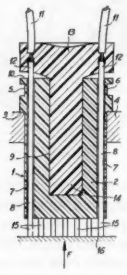
Pierre Louis Sigel, Villeneuve-le-Roi, and Henri Grosjean, Le-Plessis-Trevisse, both of France, assignors to Compagnie Honeywell Bull, Paris, France

Filed Mar. 8, 1974, Ser. No. 449,567

Claims priority, application France, Mar. 16, 1973, 73.09560

Int. Cl.[2] G01R *31/02*; **H01R** *11/02, 9/08*

U.S. Cl. 339—59 M **3 Claims**



1. A contact head for simultaneously contacting a plurality of points in an electrical circuit, said head comprising:

- a central hole and a rigid insulating support in the form of a parallelepiped and provided with a plurality of holes passing entirely through said support in a direction parallel to the length of said parallelepiped, and opening on two opposite surfaces of said support, said holes being distributed around the periphery of said support,
- a plurality of pins each adapted for sliding in one respective of said holes, each pin having one of its two ends projecting from said support at one of said opposite surfaces, and its other end projecting from said support at the other surface and soldered to a connecting lead,
- and a block of elastic material disposed against said other surface of the support, said block having a protuberance positioned within said central hole of said support, said block embedding said soldered ends of the pins and exerting an elastic action on said pins when the pins have their free ends pressed against said circuit.

3,899,234
LOW INSERTION FORCE CAM ACTUATED PRINTED CIRCUIT BOARD CONNECTOR

Marvin Leo Yeager; Homer Ernst Henschen, both of Carlisle, and Robert George Harwood, Mechanicsburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 20, 1974, Ser. No. 453,116

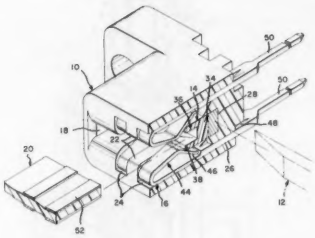
Int. Cl.[2] H01R *13/62*

U.S. Cl. 339—74 R **9 Claims**

1. A low insertion force edge board connector comprising: a housing having a longitudinally extending, elongated circuit board receiving aperture, a plurality of contact passageways in parallel spaced apart relationship in rows on each longitudinal side of the bottom of said aperture extending through a base portion of said housing, and a cam receiving groove extending longitudinally and centrally of the bottom of said aperture and opening therein, the sides of said cam receiving groove being inwardly spaced from said passageways;

a single cam means mounted for movement in said groove; contact driving means mounted in said circuit board receiving aperture lying between said passageways and at least partially within said cam receiving groove and adapted to be driven by said cam means in a direction normal to said cam receiving groove, and

a plurality of contacts each having a resilient board engaging portion, an integral terminal portion and at least one locking lance, each of said contacts being fixedly mounted in two parallel, spaced apart rows with said terminal portions thereof extending through said passageways and with free end portions of said resilient board



engaging portions positioned to be engaged by opposite sides of said contact driving means whereby all of said contacts are driven between a first position in engagement with a circuit board positioned in said circuit board receiving recess and a second position disengaged from said circuit board by a single movement of said cam means.

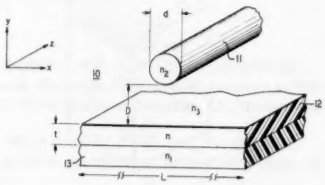
3,899,235
SLAB-COUPLED OPTICAL WAVEGUIDE

Jacques Alexis Arnaud, Colts Neck, and Enrique Alfredo Jose Marcatili, Rumson, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 11, 1974, Ser. No. 449,903

Int. Cl.[2] G02B *5/14*

U.S. Cl. 350—96 WG **9 Claims**



1. A slab-coupled optical waveguide for guiding optical wave energy having a prescribed modal spectrum comprising: a slab of low-loss dielectric material of refractive index n;

a low-loss dielectric fiber having a refractive index n_2 spaced a distance D away from said film, where D is greater than zero;

and a third low-loss dielectric material of refractive index n_3 disposed between and in contact with said slab and said fiber, where $n > n_3$ and $n_2 > n_3$;

CHARACTERIZED IN THAT:

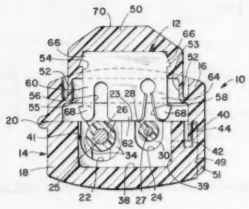
said fiber alone is capable of guiding optical wave energy having said prescribed modal spectrum and other unwanted modes;

and in that said slab alone is capable of guiding said unwanted modes but is incapable of guiding optical wave energy having said prescribed modal spectrum.

3,899,236
ELECTRICAL CONNECTOR

Anthony J. Santos, Edison, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed June 24, 1974, Ser. No. 482,149
Int. Cl. H01r *9/08*
U.S. Cl. 339—98 **13 Claims**

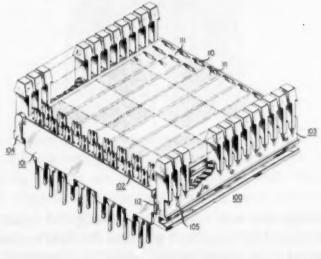


1. Electrical connector apparatus comprising:
a. an insulating body member including a first portion and a second portion, said first portion including means for receiving a plurality of insulated electrically conductive wires therein; and
b. a contact element in said second portion movable between a first position and a second position relative to said second portion for providing common electrically conductive engagement with said plurality of insulated electrically conductive wires positioned within said receiving means, said contact element including means for fixedly engaging said first portion upon movement thereof to said second position thereby providing means for locking said first portion and said second portion together upon said movement of said contact element to said second position.

3,899,237
CONNECTING BLOCK STRUCTURES FOR MODULAR MAIN DISTRIBUTION FRAMES

Paul Raymond Briggs, Jr., Andover, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 10, 1973, Ser. No. 395,632
Int. Cl.² H01R *9/06*
U.S. Cl. 339—99 **9 Claims**

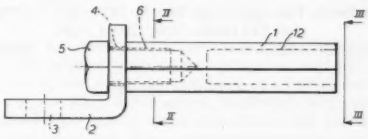


1. A connector block for modular main distribution frames comprised of
an insulating block body having a plurality of apertures therein,
a plurality of clip-type electrical terminals inserted in said apertures,
a wire fanning strip having at least one one-way gate wire retaining aperture comprising
a strip body,
first and second beam members affixed to said strip body, first and second head members affixed to said first and second beam members, respectively, each of said head members having a generally truncated tetrahedron shape,
a progressively tapered wire insertion slot, said slot narrowing in width to slightly less than the diameter of a jumper wire at said retaining aperture, said slot being formed by said first and second head members, and
first and second wire deflection lips on either side of said insertion slot, said lips being affixed to said first and second head members, for extending said slot into said retaining aperture, and
means for attaching said fanning strip to said insulating block body.

3,899,238
CABLE LOCK CONNECTOR

Gunnar Vinje, Vilbergveien 2, Oslo, Norway

Filed Apr. 4, 1974, Ser. No. 457,845
Int. Cl.² H01R *11/08*
U.S. Cl. 339—245 **3 Claims**

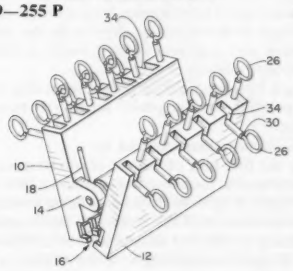


1. A cable connector comprising:
an elongated sleeve having a sector-shaped cross section for receiving a cable in a first end of the sleeve;
an angular lug having a first leg rotatably mounted to a second end of the sleeve, a second leg of the lug having means formed therein for securing the lug to a stationary support; and
fastener means disposed between the sleeve and the first leg of the lug for permitting preselected angular displacement of the lug with respect to the sleeve as well as subsequent securement therebetween.

3,899,239
INTEGRATED CIRCUIT TEST CLAMP

Frank L. Allard, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 24, 1974, Ser. No. 482,285
Int. Cl.² H01R *13/24*
U.S. Cl. 339—255 P **3 Claims**



1. An integrated circuit test clamp comprising:
a first solid body member;
a second solid body member hingedly connected to the first solid body member to form a clamping jaw;

a spring between said first and second body members biasing said jaw toward a closed position;

a plurality of contact pads along the edge of said first and second body members forming the clamping jaws;

a wire lead connected to each contact pad extending through said solid body members and out of the upper surface; and means providing maximum separation between adjacent leads;

said means for providing maximum separation comprising alternately extending leads out the top and side of said solid body members, respectively; the leads extending out of the sides being substantially perpendicular to the plane of the contact pads whereby shorting of leads is minimized by the physical separation and the solid body material between adjacent leads.

3,899,240

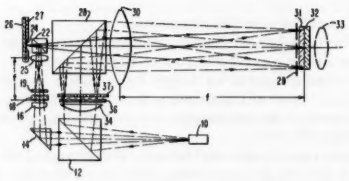
METHOD FOR DISTINGUISHING SIMILAR SUBJECTS USING DISCRIMINATING HOLOGRAMS

Dennis Gabor, London, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 48,842, June 11, 1970, Pat. No. 3,600,054, which is a continuation of Ser. No. 565,519, July 15, 1966, abandoned. This application Dec. 9, 1970, Ser. No. 96,376

Int. Cl.[2] G06G *9/00;* **G03H** *1/26*

U.S. Cl. 350—3.5 **14 Claims**



1. In a process for forming a reference hologram of a pattern having both an element in common with any other pattern and a distinctive element that comprises the steps of:

interfering on a recording medium two beams of light for a suitable exposure one of which beams is modulated by the pattern to be recorded, thereby forming on the recording medium a set of interference fringes, a first part of which is related to the common element in the pattern to be recorded and a second part of which is related to the distinctiive element;

the fringes having a location on the recording medium that is dependent on the phase relation between the two beams;

the improvement characterized by:

forming the first part of the set of interference fringes by projecting onto the recording medium a first and a reference beam of light, the first beam being modulated by the common element of the pattern to be recorded;

and forming a different second part of the set of interference fringes by projecting onto the medium a third and a reference beam of light, the third beam being modulated by the distinctive element of the pattern to be recorded; and

the phase relation between the third and reference beams being different from the phase relation between the first and reference beams.

3,899,241

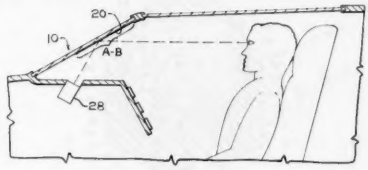
VISUAL DISPLAY WINDSHIELD

Rudolph L. Malobicky, Jr., New Kensington, Pa.; James B. Perkins, Huntsville, and Robert H. Taylor, New Market, both of Ala., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 11, 1973, Ser. No. 423,840

Int. Cl. G02b *27/14*

U.S. Cl. 350—174 **4 Claims**



1. An aircraft forward vision area windshield comprising:

a flat lamination of a plurality of transparent plies having a central vision area provided with a high degree of optical regularity which is surrounded by marginal areas for which optical regularity is less critical; and

a visual image receiving area on said lamination consisting of a transparent, reflective, cathodically sputtered, metal oxide coating having an index of refraction of at least about 2.0 on a substantial portion of the inboard surface of said central area, said visual image receiving area being at least 60% visible light transmissive normal to the plane of the windshield and having a reflectivity to visible light of less than about 25% from the inboard side at an angle of 60° from normal to the plane of the windshield.

3,899,242

REPRODUCTION LENS SYSTEM

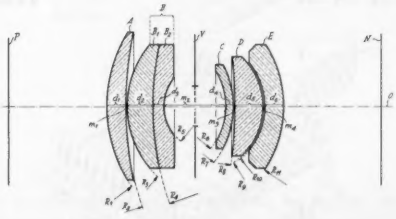
Miloslav Paukert, and Libuse Schwarzova, both of Prerov, Czechoslovakia, assignors to Meopta, narodni Podnik, Prerov, Czechoslovakia

Filed Jan. 21, 1974, Ser. No. 434,943

Claims priority, application Czechoslovakia, Feb. 28, 1973, 1431-73

Int. Cl. G02b *9/60*

U.S. Cl. 350—216 **4 Claims**



1. An objective lens system comprising five optical components separated by airspaces wherein the first optical component, placed next to the image plane, is a positive meniscus, the second optical component adjacent to it is a negative meniscus composed of two cemented elements, both said first and second components representing the front portion of the objective, the third, fourth and fifth components comprise the rear portion of the objective and consist of three menisci the two extreme ones having a negative refractivity, the middle one having a positive refractivity, said front and rear portions being separated by a large space in which a mechanical diaphragm is located, and wherein the design parameters conform substantially to:

		n_d	ν
$R_1 = +43.87$			
$R_2 = +114.88$	$d_1 = 6.15$	1.70154	41.1
$R_3 = +29.93$	$m_1 = 0.18$	air	
$R_4 = +92.51$	$d_2 = 8.45$	1.70154	41.1
$R_5 = +19.15$	$d_3 = 3.40$	1.76182	26.5
$R_6 = -20.9$	$m_2 = 19.25$	air	
$R_7 = -28.06$	$d_4 = 2.48$	1.57501	41.3
$R_8 = -144.2$	$m_3 = 0.18$	air	
$R_9 = -21.29$	$d_5 = 9.28$	1.65844	50.8
$R_{10} = -21.39$	$m_4 = 0.37$	air	
$R_{11} = -36.63$	$d_6 = 5.97$	1.62536	35.6

wherein

$f_A = +97.68$
$f_B = -107.62$
$f_C = -163.06$
$f_D = +36.83$
$f_E = -96.80$

where

$R_1 - R_{11}$ are the radii of curvature of individual refracting surfaces;

$d_1 - d_6$ are the axial thicknesses of individual elements;

$m_1 - m_4$ are axial airspaces between individual optical components;

n_d is the refractive index for the spectral D-line;

ν is the Abbe number

and

f_A, f_B, f_C, f_D, f_E are the focal lengths of individual optical components.

3,899,243
ARRANGEMENT FOR VIEWING THE INTERIOR OF A PRESSURE VESSEL

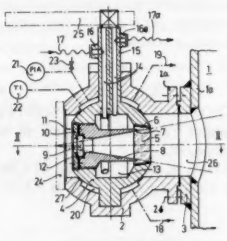
Wilhelm Haverkamp, Essen, Germany, assignor to Heinrich Koppers Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Dec. 19, 1973, Ser. No. 426,361

Claims priority, application Germany, Dec. 20, 1972, 2262351

Int. Cl.[2] G02B *27/00*

U.S. Cl. 350—319 **10 Claims**



1. An arrangement for viewing the interior of a pressure vessel which has a wall provided with a viewing port, comprising a housing having an interior provided with two axially spaced and aligned openings; connecting means for sealingly connecting said housing to said wall so that one of said openings registers with said viewing port; a body of revolution having a bore provided with two axially spaced open ends and being sealingly accommodated in said interior of said housing for turning to and from a position in which said bore registers with said openings; optical means sealingly mounted in said bore for permitting viewing of the interior of said pressure vessel when said body is in said position thereof, said optical means comprising a first optical element sealingly mounted in said bore in the region of one of said open ends, and a second optical element sealingly accommodated in said bore in the region of the other of said open ends; and retaining means retaining said second optical element in said bore.

3,899,244
DEVICE FOR VIEWING UNDER WATER

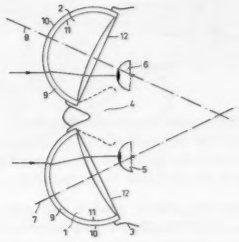
Hendrik Mulder, Delft, Netherlands, assignor to N. V. Optische Industrie de Oude Delft, Delft, Netherlands

Filed Aug. 26, 1974, Ser. No. 500,588

Claims priority, application Netherlands, Sept. 7, 1973, 7312361

Int. Cl.[2] G02C *1/00*; **G02B** *3/04*

U.S. Cl. 351—43 **3 Claims**



1. Device for viewing under water comprising two identical optical lens systems, each of the systems as seen from the object side to the image side consisting of a first component with a concave image-sided surface, an air space and a second component in the form of a lens of positive power, the image-sided nodal point of the first component substantially coinciding with the object-sided nodal point of the second component, the total dioptric power of each of the systems being substantially zero under water characterized in that the optical axes of the optical lens system converge towards the image side and include an angle between 40° and 60° and in that one of the two components of each of the optical lens systems comprises an aspherical surface.

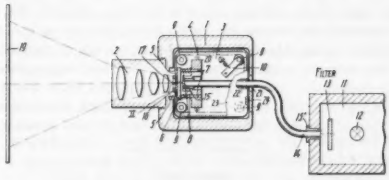
3,899,245
TESTING DEVICE FOR CINEMATOGRAPHIC CAMERAS

Helmuth Bernhardt, Bad Kreuznach, Germany, assignor to Jos. Schneider & Co. Optische Werke Kreuznach, Bad Kreuznach, Germany

Filed Dec. 3, 1973, Ser. No. 421,481

Int. Cl. G03b *23/02*

U.S. Cl. 352—72 **7 Claims**



1. A device for testing the performance of a camera provided with an objective and with film-transport means for aligning successive film frames with said objective, comprising a light box, a cartridge insertable into said camera and provided with a front wall having a window, a set of rollers in said cartridge, an endless test film in said cartridge led around said rollers past said window for entrainment by said film-transport means, and a fiber-optical cable extending from said light box into said cartridge to a location in line with said window behind said film for transluminating same.

3,899,246

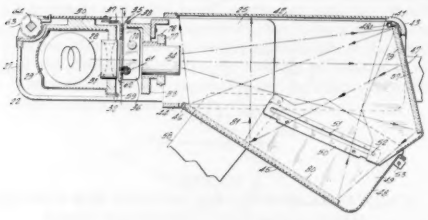
COMBINED MICROFICHE READER AND PROJECTOR

Arthur Edelstein, Jamaica, N.Y., assignor to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 133,294, April 12, 1971, abandoned. This application June 18, 1973, Ser. No. 371,218

Int. Cl. G03b *23/08, 21/30*

U.S. Cl. 353—27 **8 Claims**



1. A combined microfiche reader and projector system, book-like in size and handling characteristics comprising a first fixed hollow housing, and a second movable housing slidably and telescopically coupled therewith and being telescopically movable between a first inoperative position, and a second operative position, said second housing being selectively disengageable from said first housing to permit use of said system as a projector adapted to form images on a remote surface, a projection lamp compartment within the first housing, a projection lamp in said compartment for connection to a power source, a reflector carried within the projection lamp compartment to direct the light from the projection lamp through the housings, a projection lens assembly carried by the first housing to receive the light from the projection lamp, a first mirror within the second housing adapted to receive light coming from the projection lens assembly when said first and second housing are in engagement with each other, means to hold the said first mirror at an angle with respect to the optical axis of the projection lens assembly, a second mirror swingably carried by the second housing to receive light reflected by the first mirror only when said second housing is in its second operative position, means to hold the said second mirror at an angle with respect to the plane of the first mirror, a rear projection screen stationarily mounted within and carried by the second housing to receive light reflected by the second mirror, means to hold a microfiche card between the lamp and the projection lens assembly and means adjacent the periphery of the fixed housing to move the microfiche card within the housing to bring selected areas of the said card into register with the projection lens assembly, wherein the first mirror is carried upon a first mirror mount swingably secured to the side of the second movable housing adjacent the side wall thereof, the second mirror is carried upon a second mirror mount swingably secured to the side walls of the second movable housing adjacent the rear thereof, said mirror mounts being operatively coupled together adjacent their free ends and being movable responsive to telescoping movement of said second housing between its first and second positions.

3,899,247

OPTICAL POSITION INDICATOR

Werner Faller, Bad Kreuznach, Germany, assignor to Jos. Schneider & Co. Optische Werke Kreuznach, Bad Kreuznach, Germany

Filed Dec. 3, 1973, Ser. No. 421,480

Claims priority, application Germany, Dec. 4, 1972, 2259318

Int. Cl. G01b *9/08, 9/00*

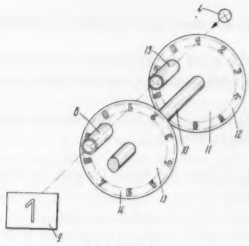
U.S. Cl. 353—40 **10 Claims**

1. A position indicator comprising:

a scale carrier displaceable in at least one dimension into a succession of discrete operating positions, said carrier being provided with correlated first and second sets of light-transmissive areas on a contrasting background, the areas of each set following one another in a direction of displacement of said carrier;

optical means forming a light path with an incoming branch and an outgoing branch respectively aligned in any of said operating positions with an individual area of said first set and with an associated area of said second set respectively correlated therewith, at least one of the two areas simultaneously disposed in said light path forming an alphanumerical symbol characterizing the particular operating position defined by the coincidence of said two areas in said light path;

image-receiving means forming a display surface in line with said outgoing branch of said light path; and



a source of light in line with said incoming branch of said light path for illuminating an area of said first set in each of said operating positions;

said optical means including projection means for superposing the image of an illuminated area of said first set upon the associated area of said second set in any operating position to focus the superposed images of said illuminated area and said associated area upon said display surface, and ray-transposing means for shifting said superposed images in opposite directions on said display surfaces upon displacement of said scale carrier whereby said images register with each other only in the corresponding operating position.

3,899,248

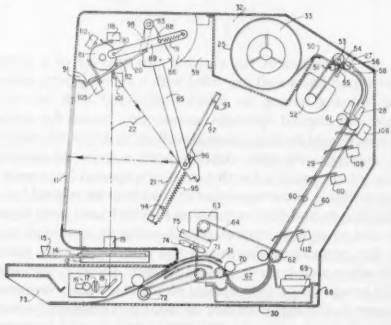
MICROFICHE READER-PRINTER

Emil Tiger, Highland Park, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 8, 1973, Ser. No. 414,064

Int. Cl. G03g *15/00;* **G03b** *13/28*

U.S. Cl. 355—5 **5 Claims**



1. A microfiche reader-printer comprising:

a housing;
a control panel on the front of said housing;
a microfiche carrier operably disposed on the front of said housing to receive a microfiche therein;
a viewing screen disposed across the front of said housing;
an image projector disposed to project a light beam through said fiche and magnify said light beam, including a fiche image;
a pair of reflecting mirrors movable to one position for reflecting the projected image to the back side of said screen to permit viewing thereof;
a positioner mechanism mechanically operative to shift the positions of said mirrors to a second position;
a motorized timing cam mechanically linked to effect the selective operation of the mirror positioning mechanism;
a continous paper supply source within the housing;
a drive mechanism to feed said paper from said source;
a paper measuring means;
a rotary paper cutter for cutting a piece of said paper from said paper source comprising:
a frame comprising a pair of end vertical sidewalls and a horizontal support member therebetween, a rotary cutting blade having first and second ends and a traveler cam at each said end, one said cam being smaller in radius than the other and said blade mounted between said sidewalls for cutting engagement with the paper sheet above the paper sheet, a cutting bar having a cutting edge on the near end thereof, said cutting edge being disposed beneath said cutting blade for cooperative engagement with said blade to cut a paper sheet therebetween, said bar having first and second ends, said first end being mounted to one said sidewall about a pivot at the far end of said bar and arranged for arcuate movement about said pivot, and said second end being mounted at the other said sidewall and arranged for horizontal movement only, and means at each said bar end for urging said bar ends against said blade cams, said different cam radii causing said blade to overlap said bar by a desired amount;
a paper corona unit to place an electrostatic charge on the surface of said paper;
a conveyor to receive and move said severed piece of paper to an exposure position where the paper is exposed to the light beam from one of said mirrors;
a toner developing means disposed to receive said paper after exposure;
a squeegee and dryer operative to dry the paper;
a discharge chute to convey said sheet of paper to an outlet on the front of said housing; and
a control circuit selectively operative to initiate a reading cycle and a succeeding printing cycle whereby any selected microfiche image may be readily read and a printed copy thereof obtained.

3,899,249

ELECTROPHOTOGRAPHIC APPARATUS

Toru Takahashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

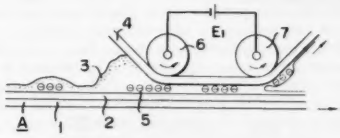
Continuation of Ser. No. 179,073, Sept. 9, 1971, abandoned, which is a division of Ser. No. 729,567, May 16, 1968, Pat. No. 3,663,219. This application May 11, 1973, Ser. No. 359,221

Claims priority, application Japan, May 23, 1967, 42-32962; June 29, 1967, 42-56049[U]

Int. Cl. G03g *15/10*

U.S. Cl. 355—10 **2 Claims**

1. An electrophotographic apparatus for reproducing an original image on copy material comprising: means for forming an electrostatic latent image of said original image on an electrophotographic photosensitive member; means for developing said electrostatic latent image with a liquid developer containing a liquid carrier and charged toner particles to form a toner image on said photosensitive member; means for contacting said toner image with said copy material and squeezing said photosensitive member and said copy material to remove excessive amounts of liquid carrier; means for applying an electric field in a direction and having an amplitude to maintain said charged toner particles on the surface of said photosensitive member during said squeezing of said photosensitive member and said copy material; means for



thereafter transferring said toner image onto said copy material by contacting said copy material with said photosensitive member and means for applying an electric field which attracts the transferred toner image to the surface of said copy material.

3,899,250

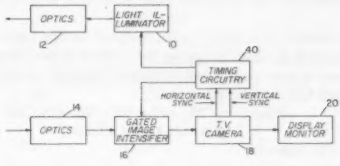
ACTIVE-GATED TELEVISION AUTOMATIC RANGE SWEEP TECHNIQUE

Jack A. Bamberg; Hans R. Bucher, and John G. Bultena, all of Boulder, Colo., assignors to Ball Brothers Research Corporation, Boulder, Colo.

Filed Feb. 4, 1974, Ser. No. 439,182

Int. Cl. G01c *3/08;* **H04n** *3/00*

U.S. Cl. 356—5 **27 Claims**



20. An active-gated television automatic range sweep device comprising:
illumination means for illuminating targets at different range intervals;
receiving means including a television camera for receiving illumination reflected by said targets; and
timing means for controlling said illumination means and said receiving means such that discrete ranges are sequentially viewed during a television line time to thereby sweep out an entire depth of range within a television frame.

3,899,251

APPARATUS AND METHOD FOR MEASURING THE RELATIVE DISTANCE AND OPTIONALLY THE RELATIVE VELOCITY OF AN OBJECT

Helmuth Frenk, and Ludwig Leitz, both of Wetzlar, Germany, assignors to Ernst Leitz GmbH, Wetzlar, Germany

Filed Feb. 25, 1974, Ser. No. 445,808

Claims priority, application Germany, Feb. 26, 1973, 2309462

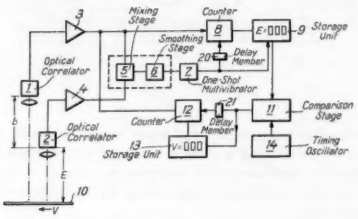
Int. Cl.[2] G01C *3/08;* **G01P** *3/36*

U.S. Cl. 356—28 **12 Claims**

1. An apparatus for measuring the distance and velocity of an object relative to a reference system, comprising:
a. an object;
b. two optical correlator systems each of which has a different distance from said object and an optical axis thereon,

said correlator systems generating electrical output signals having a given frequency;

c. means connected to said electrical output signals for mixing said electrical output signals and generating an auxiliary signal having a given auxiliary frequency comprising the difference in frequency of said electrical output signals; and



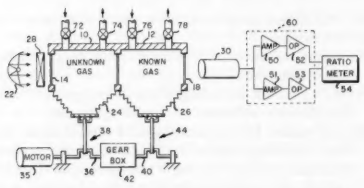
d. means for counting the number of signal cycles of one of said electrical output signals during the period of time necessary for one cycle of said auxiliary frequency and indicating the number of signal cycles as a value proportional to the distance.

3,899,252

NDIR GAS ANALYZER BASED ON ABSORPTION MODULATION RATIOS FOR KNOWN AND UNKNOWN SAMPLES

John Dimeff, San Jose, Calif., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed June 28, 1974, Ser. No. 484,208
Int. Cl. G01n *21/26*
U.S. Cl. 356—51 **15 Claims**



1. A nondispersive gas analyzing apparatus comprising:

a first means for containing a first gas sample including a reference gas;

a second means for containing a second gas sample including an unknown amount of said reference gas;

a means for passing radiant energy through said first and said second gas samples for permitting at least partial absorption of said energy by said gas samples;

a means for modulating the amount of said energy absorbed by said gas samples at a first and a second frequency;

a means responsive to the unabsorbed energy passing through said gas samples for generating a first signal at said first frequency and a second signal at said second frequency; and

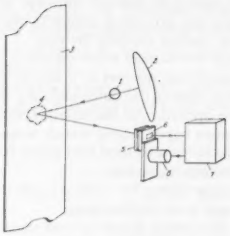
a means responsive to said first and said second signals for generating a third signal proportional to the density of said reference gas in said second gas sample.

3,899,253

APPARATUS AND METHOD FOR AUTOMATIC CROSS CORRELATION INTERFEROMETRY

Mario W. Overhoff, P.O. Box 8091, Cincinnati, Ohio 45208

Filed Sept. 10, 1973, Ser. No. 395,649
Int. Cl.² G01B *9/02*
U.S. Cl. 356—108 **11 Claims**



1. Interferometric apparatus for determining a physical parameter of a product comprising

a source of broadband radiation emitting within a predetermined spectrum,

a broadband radiation detector responsive to propagated radiation emitted by said source and forming a signal proportional to the radiation detected,

a multiple reflection interferometer interposed with the product in the path of the propagated radiation detected by said detector and modifying such radiation, said interferometer having two relatively opposed optical surfaces, one of which surfaces being partially transmissive and the other being at least partially reflective of the radiation and including means coupled therewith for varying the physical spacing between said surfaces, and

electrical circuit means interconnected with said radiation detector and said interferometer responsive to the detector signal for varying the spacing of said optical surfaces by a periodic signal superimposed on a variable steady state signal to provide an output proportional to the cross correlation between interferometric properties of the product and said interferometer and indicative of the product parameter.

3,899,254

CHEMICAL LIGHT METER AND METHOD OF MEASURING LIGHT THEREWITH

George D. Dixon, Monroeville; David H. Davies, and John D. Voytko, both of Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 31, 1973, Ser. No. 384,323
Int. Cl.² G01J *1/48*
U.S. Cl. 356—234 **24 Claims**

1. A chemical light meter comprising a sealed tube containing

A. a composition which comprises:
1. a solvent:
2. about 0.1 to about 10% of a polymer having a molecular weight of at least 50,000 entirely dissolved in said solvent, which polymer degrades in the presence of light of a first wavelength; and
3. about 10 ppm to about 2% of a photodegrading compound entirely dissolved in said solvent which degrades said polymer when exposed to light of a second wavelength; and

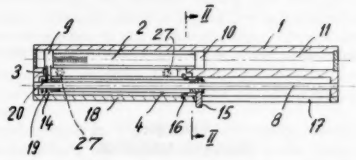
B. means for measuring the viscosity of said composition.

3,899,255

MEASURING DEVICE

Johann Meier, Brione sopra Minusio, Switzerland, assignor to Premisure AG, Instrumente fur Prazisions-Messung, Solothurn, Switzerland

Filed May 18, 1973, Ser. No. 361,587
Int. Cl. G01b *11/02*
U.S. Cl. 356—169 **7 Claims**



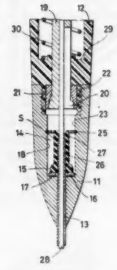
7. A measuring device as set forth in claim **1**, wherein said seal is formed by a lip seal.

3,899,256

MECHANICAL PENCIL

Yoshihide Mitsuya, 1,3-chome, Higashi Nagata, Jhoto-ku, Osaka, Japan

Filed Apr. 10, 1974, Ser. No. 459,854
Int. Cl. B43k *21/16*
U.S. Cl. 401—65 **1 Claim**



1. In a mechanical lead pencil having a forward tip with a cavity therein for containing a movable cylinder portion comprised of a lead-protecting tube extending through and beyond said tip and an outside tube covering within said cavity for surrounding a portion of the end of said lead-protecting tube within said cavity, and a push button controlled chuck located above said movable cylinder when said forward tip is pointed downward for holding and controlling the movement of lead in said pencil through said lead-protecting tube in response to depressing the push button, the improvement comprising:

a ring located around said lead-protecting tube immediately below said outside tube covering within said cavity when the forward tip is pointed downward, said ring having an inside radius sufficiently large that the difference between the inside radius of said ring and the radius of said lead-protecting tube is greater than the difference between the outside radius of the ring and the radius of the cavity in which said ring is located, thereby preventing said ring from contacting said lead-protecting tube at any point; and

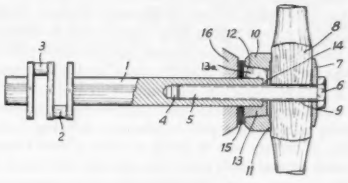
an enlarged portion at the bottom of said outside tube covering immediately above said ring when said forward tip is pointed downward for preventing said ring from sliding over said outside tube covering when said forward tip is pointed upward, whereby pointing the forward tip upward and releasing said chuck surrounding the lead causes the lead and the lead-protecting tube to fall into the tip of the pencil under their own weight and under the force of the weight of the ring exerted against the enlarged portion of the outside tube.

3,899,257

DEVICE FOR FIXING A ROTOR ON A ROTATABLE SHAFT

Andre Gladieux, 97, Avenue de la Republique, Paris (11°), France

Filed Mar. 13, 1973, Ser. No. 340,651
Claims priority, application France, Mar. 17, 1972, 72.09541
Int. Cl.[2] F16D *1/06*
U.S. Cl. 403—259 **1 Claim**



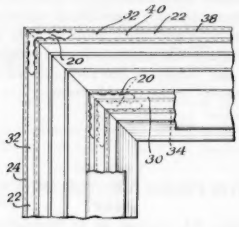
1. In a model internal combustion engine having a crankcase and a crankshaft which protrudes from said crankcase, the improvement which comprises a tapped bore in the end of the crankshaft protruding from the crankcase, a sleeve surrounding said protruding end of the crankshaft, means defining a stepped bore in said sleeve with a larger diameter portion receiving said crankshaft and a smaller diameter portion, a shoulder between said larger and smaller diameter portions of the stepped bore abutting the end face of the crankshaft at the protruding end thereof, means defining a conical outer surface on said sleeve, means defining a slit extending longitudinally through said sleeve and extending between the stepped bore and conical outer surface thereof, a ring carried on said sleeve and having a conical bore conforming to and engaging the conical outer surface of said sleeve, a washer, a propeller received between said ring and washer, a screw extending through said washer, propeller, ring, smaller diameter portion of said sleeve and received in threaded engagement with said tapped bore to compress the propeller between said ring and washer and to thereby apply to the ring axial forces compressing and securing same against said sleeve whereby said sleeve, ring, propeller, washer, screw and crankshaft are rotatable in unison, and spacer means disposed in a clearance space between said sleeve and the crankcase to limit the bending deflection of the crankshaft portion that protrudes from the crankcase.

3,899,258

CORNER STRUCTURE FOR DOOR FRAMES AND THE LIKE

David G. Matthews, 5439 W. Lawrence Ave., Glenview, Ill. 60630

Filed Mar. 26, 1973, Ser. No. 345,007
Int. Cl. F16b *13/04, 12/32*
U.S. Cl. 403—292 1 Claim



1. A frame comprising a plurality of metallic elongated frame members, said frame members having mitered ends and having channel means defined therein, said channel means having a first pair of channel defining walls spaced a first distance apart, and a second pair of channel defining walls spaced a second distance apart, said mitered ends being in abutting relationship, a corner key for securing two elongated frame members together at said abutting ends to define corners, said corner key being of unitary, completely solid construction and being devoid of apertures therein, each corner key having a pair of legs at right angles to each other, each leg being rectangular in cross section and having a pair of opposite sides and a pair of opposite edges, said sides being spaced apart a distance which is substantially equal to said first distance and being received in said channel means in close sliding proximity to said first pair of channel defining walls, and a plurality of unitary sets of barbs on each of said edges of said legs, each of said barb sets including an outermost barb set with the spaced apart dimension of said outermost set being at least slightly greater than said second distance so as to provide for positive biting interengagement of said outermost set with the metal defining said second walls of said channel means, and also including an innermost set of barbs with the spaced apart dimension of said innermost barb set being greater than said spaced apart distance of said first barb set to assure positive biting interengagement of said innermost barb set with the metal defining said second spaced walls, the biting interengagement of said barbs with the metal of said walls defining the sole means for securing said frame members together.

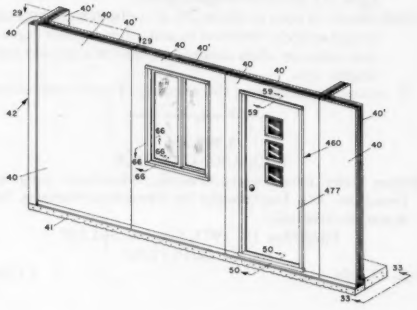
3,899,259

CONNECTOR ELEMENT FOR USE IN MODULAR WALL CONSTRUCTION

G. Newton Boice, McKeesport, Pa., assignor to Structural Systems, Inc., McKeesport, Pa.

Division of Ser. No. 214,539, Jan. 3, 1972, Pat. No. 3,800,489.
This application Aug. 6, 1973, Ser. No. 385,710
Int. Cl. E04b *1/40*
U.S. Cl. 403—405 8 Claims

8. A support element for mounting angularly related structural members thereon comprising: a web portion and at least one extension forming a continuation of said web and formed integral therewith; a pluraliity of openings provided in said web portion and said extension; tubular spacer elements rigidly secured to one side of said web portion and said extension and having openings therethrough in registry with certain openings in said web and said extension for receiving fastening means therethrough wherein each of said spacer elements comprises a plurality of tabs formed integral with said support element and bent outwardly therefrom to project generally



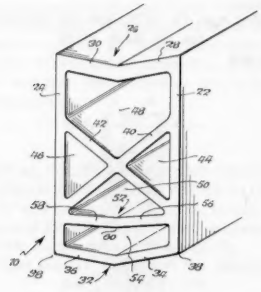
normal thereto; and a sleeve slip fitted over said projecting tabs.

3,899,260

SEALING MEMBER

James J. Kerschner, Kenmore, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.

Filed Apr. 6, 1973, Ser. No. 348,494
Int. Cl.[2] E01C *11/10*
U.S. Cl. 404—64 9 Claims



1. A sealing member comprising: a resiliently yieldable tubular body having a top wall, a bottom wall and opposite side walls, an internal supporting truss structure within said body and formed integral therewith, said internal truss structure including a pair of cross bars extending downwardly at an angle from said side walls at points spaced below the upper ends thereof to the opposite side walls at points spaced above the lower ends thereof, said cross bars intersecting intermediate their opposite ends, a generally horizontally extending compression bar extending transversely from one of said side walls to the other of said side walls below the intersection of the lower ends of said cross bars with said side walls in spaced relation to said bottom wall for preventing buckling of said side walls upon compression and facilitating the controlled collapse of said body.

3,899,261
EXPANSION JOINT BATTEN OR PACKING OF DILATION JOINT

Andre Mieville, Lausanne, Switzerland, assignor to Helka S.A., Switzerland

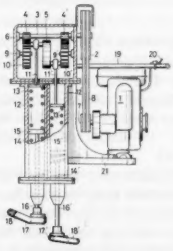
Filed Mar. 23, 1973, Ser. No. 344,437
Claims priority, application Switzerland, Mar. 27, 1972, 4506/72
Int. Cl. E01c *11/02*
U.S. Cl. 404—68 **9 Claims**

1. An expansion joint for a roadway, comprising:
a. an elastic member insertable between first and second roadway sections spaced apart widely in a direction along the roadway, the member having first and second portions, adjacent respectively said first and second roadway sections when in use, extending therebetween and being expandable and contractible in response to contraction and expansion, respectively of the roadway to reach from one of said roadway sections to the other, in said direction;
b. said member having a plurality of cavities, also extending substantially from one road section to the other, in said direction, and laterally spaced in said member, said elastic member and said cavities having a greater dimension in said direction along the roadway than said member is thick;
c. for each cavity a rigid bar positioned therein, each extending over a major portion of the length of the corresponding cavity and longitudinally movable relative thereto; and
d. a plurality of metal plates imbedded in said elastic member adjacent said end portions thereof, said plates including means, adjacent respective ends of said bars, for anchoring said elastic member to the roadway;
whereby said elastic member is elastically expandable and contractible over a considerable distance and is at the same time enabled by said bars to support considerable loads bearing down on said member.

3,899,262
EARTH TAMPER

Shinzo Yamamoto, Kawasaki, Japan, assignor to Nihon Kensetsu Kikai Sangyo Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 17, 1973, Ser. No. 389,258
Claims priority, application Japan, Feb. 21, 1973, 48-21607
Int. Cl.[2] E01C *19/30*
U.S. Cl. 404—133 **1 Claim**

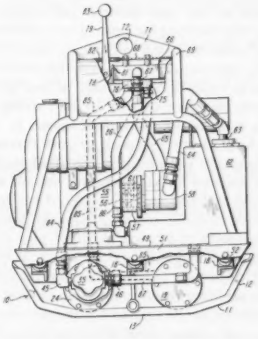


1. A hand-guided earth tamper adapted to be moved in a forward direction and having two alternately actuatable tamping foot plates comprising a frame means, a crankshaft rotatably mounted on said frame means and having two 180° offset arms, a prime mover mounted on said frame means, a transmission operably disposed between said prime mover and said crankshaft and through which said prime mover drives said crankshaft, a pair of upper driving rods with respective upper ends pivotally connected to said two arms of the crankshaft, two guide cylinders disposed below said crankshaft, said upper driving rods extending into said two guide cylinders respectively, piston plates slidably disposed within said cylinders, a pair of lower driving rods having upper ends secured to the piston plates so as to follow the movement of the latter, compression springs arranged between the lower ends of the upper driving rods and the piston plates, compression springs arranged between the piston plates and the lower ends of the cylinders, a leading foot plate and a trailing foot plate secured to the lower ends of each of the lower driving rods, whereby the two 180° offset arms effect upward movement of one foot plate while the other foot plate is moving downwardly to thereby provide a stable posture to the tamper, both of said foot plates being disposed at an acute angle relative to the longitudinal axes of said guide cylinders to provide for automatic forward movement of the tamper, whereby the tamper is hand-guided in said forward direction in a forwardly inclined disposition with said leading foot plate and said trailing foot plate arranged in series relative to said forward direction such that the earth tamped by the leading foot plate is subsequently tamped by the trailing foot plate.

3,899,263
COMPACTOR

Eugene C. Briggs, and Lee E. Reichel, both of Dayton, Ohio, assignors to Koehring Company, Milwaukee, Wis.

Continuation of Ser. No. 322,405, Jan. 10, 1973, abandoned. This application Nov. 7, 1974, Ser. No. 521,844
Int. Cl.[2] E01C *19/34*
U.S. Cl. 404—133 **12 Claims**



1. A vibratory plate compactor including a work engaging vibratory base plate, a pair of exciter means, means mounting said exciter means in a closely adjacent connected relation to and for rotation on said base plate, said exciter means being positioned in a longitudinally spaced relation and having their axes of rotation extended in a sense transversely of said base plate, a separate motor connected with each exciter means having in connection therewith means for a separate and independent drive thereof, said motors being operable independently of one another and connected to drive the associated exciter means in respectively opposite directions, and control means associated with said motor drive means providing that one motor which is operating may be deenergized and the other motor energized substantially simultaneously.

3,899,264

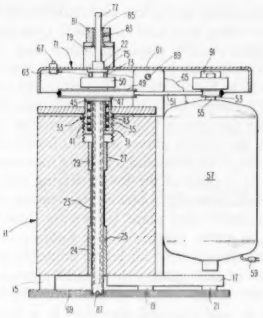
HOLE CUTTER DEVICE FOR GRAPHIC ARTS ACTIVITY

Philip E. Tobias, 1872 Watson Rd., Abington, Pa. 19001

Filed July 15, 1974, Ser. No. 488,533

Int. Cl. B23b *47/00*

U.S. Cl. 408—14 5 Claims



1. A hole cutter device for cutting holes in film material, paper material and the like, comprising in combination: housing means having a top and a base, and further having an aperture disposed to pass through said housing from said base to said top, said aperture formed to have an enlarged section at the top thereof; spring means; adjusting means having a top and a base and formed to fit into said enlarged section, said adjusting means further formed to have an aperture therethrough with said last-mentioned aperture being aligned with said aperture of said housing means when said adjusting means is fitted into said enlarged section, said adjusting means further formed to hold said spring means whereby said spring means extends beyond said top of said adjusting means when in a non-compressed state; hollow shaft means formed to have cutting teeth at one end thereof and disposed within said apertures in said housing means and said adjusting means with said cutting teeth disposed in close proximity to said base of said housing means; driving means secured to said hollow shaft means in order to rotate said hollow shaft means, said driving means disposed to rest on said spring loaded means and thereby hold said hollow shaft means in a first position; rod means formed and disposed to pass through said hollow shaft and protrude therefrom in said first position; first support means secured to said housing means and to said rod means to hold said rod means in a fixed position; and second support means movably mounted on said housing means and formed to respond to a force to direct said driving means to compress said spring means and thereby to come to rest on the top of said adjusting means whereby said hollow shaft is moved from said first position and said cutting teeth are urged into the material to be cut and whereby when said force is terminated, said cutting teeth are urged away from said material to be cut by the expansion of said spring means as it returns said hollow shaft to said first position.

3,899,265

METHOD AND APPARATUS TO PERFORATE PIPE

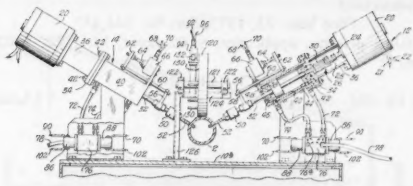
David Lang, Mineral Wells, Tex., assignor to Harsco Corporation, Harrisburg, Pa.

Division of Ser. No. 266,552, June 27, 1972, abandoned. This application Dec. 27, 1973, Ser. No. 428,625

Int. Cl.[2] B29C *17/10*

U.S. Cl. 408—50 7 Claims

1. Pipe perforating apparatus comprising support means; a cam wheel rotatably secured to said support means and positionable in rolling engagement with a pipe; a shaft; a drill bit secured to said shaft; means movably securing said shaft relative to the support means; means secured to the shaft to rotate said shaft; actuated means secured between said shaft and said support means to move said shaft toward a pipe disposed in engagement with said cam wheel; actuating means associated with said cam wheel, said actuating means being arranged to



actuate the actuated means to move the shaft toward a pipe; and means secured between said shaft and said support means for moving the shaft away from a pipe in engagement with said cam wheel.

3,899,266

VORTEX BLOWER

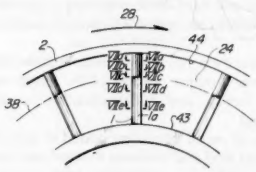
Tadahisa Masai; Tetsuro Adachi, both of Hitachi; Shigeru Sasaki, Katsuta, and Kazuyoshi Moriyama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 7, 1973, Ser. No. 422,697

Claims priority, application Japan, Dec. 18, 1972, 47-126106; Feb. 12, 1973, 48-16596

Int. Cl. F04d *7/00*

U.S. Cl. 415—213 T 1 Claim



1. A vortex blower consisting of a stator body including an air passage having a suction port and a discharge port open thereto in the vicinity of the opposite ends of said passage and a rotor body having an air chamber divided into compartments by a plurality of rotor blades, in which the edge faces of the rotor blades in the vicinity of the inner circumference thereof is inclined rearwardly with respect to the rotational direction of said rotor body, the edge face of a rotor blade covering from the inner circumference to the outer circumference of said blade being so inclined that the height of the blade at the trailing edge of said edge face with respect to the rotational direction of the rotor is greater than that of the blade at the leading edge of said edge face.

3,899,267

TURBOMACHINERY BLADE TIP CAP CONFIGURATION

Ronald E. Dennis, Cincinnati; William D. Treece, Forest Park, and Robert J. Corsmeier, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Apr. 27, 1973, Ser. No. 355,150

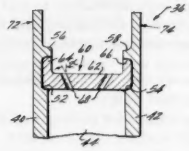
Int. Cl. F01d *5/08*

U.S. Cl. 416—92 8 Claims

1. In a turbomachinery blade of the type comprising an airfoil-shaped, hollow body portion having a pair of side walls defining an internal cavity therebetween, and an airfoil-shaped tip cap defining the outer bounds of said internal cavity, the improvement comprising:

each of said side walls includes a tip cap seat formed integrally therewith on the inner side thereof and at least one tip cap retaining member formed integrally therewith on

the inner side thereof and radially spaced from said seat so as to be capable of capturing said tip cap between said



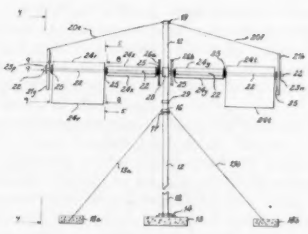
seats and said retaining members such that said tip cap is mechanically secured to said blade.

3,899,268

WIND-DRIVEN MOTIVE APPARATUS

Edwin K. Hillman, 907 W. Desert Cove, Phoenix, Ariz. 85029

Filed Feb. 11, 1974, Ser. No. 441,483
Int. Cl.[2] F03D *3/06*
U.S. Cl. 416—117 **10 Claims**



1. Apparatus responsive to the force of the wind for generating power, said apparatus comprising in combination:

a. a plurality of vanes for rotatably responding to the force of the wind;

b. a horizontally oriented shaft for supporting said plurality of vanes;

c. key means for maintaining a non-rotatable relationship intermediate said plurality of vanes and said shaft such that rotation of said plurality of vanes in response to the force of the wind produces a commensurate rotation of said shaft;

d. slot means disposed within each of said plurality of vanes for engaging said shaft, said slot means accommodating downward sliding movement of each of said plurality of vanes in response to the force of gravity to periodically laterally reposition each of said plurality of vanes as said plurality of vanes and said shaft rotate such that each of said plurality of vanes presents a greater surface area to the force of the wind below said shaft than above said shaft;

e. a power takeoff pulley attached to said shaft for transmitting power to a power consuming element; and

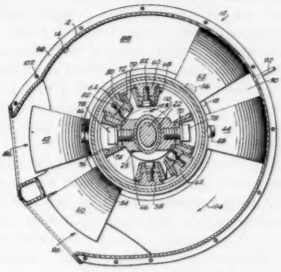
f. mast means for supporting said shaft and said plurality of vanes in the wind; whereby, the disparate surface area above and below said shaft which is presented to the prevailing wind by the sliding action of said plurality of vanes induces rotation of said shaft and said power takeoff pulley.

3,899,269

ROTARY POWER DEVICE

Morris B. Diamond, 201 Highland Ave., Apt. A5, Highland Park, Mich. 48203

Filed Aug. 20, 1973, Ser. No. 370,956
Int. Cl. F02b *53/00*
U.S. Cl. 418—35 **5 Claims**



1. A rotary power device comprising:

a. a main drive shaft;

b. a toroidal housing disposed about said drive shaft in an inclined plane at a predetermined angle relative to said drive shaft;

c. a toroidal cylinder, formed in said toroidal housing, in said inclined plane;

d. first and second rotors, individually, rotatably mounted in said inclined plane in the central hole defined by said toroidal housing;

e. means to link said drive shaft to the respective rotors; and including,

1. first pivot means, radially extending from said main drive shaft,

2. second pivot means connecting to said first and second rotors, and

3. link means pivotally connecting between said first and second pivot means;

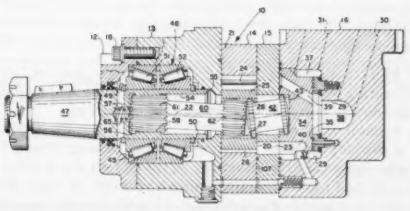
f. piston means, disposed in said toroidal cylinder, connected to each of said rotors.

3,899,270

DRIVE CONNECTION MEANS FOR A HYDRAULIC DEVICE

Nils Einar Swedberg, Chanhassen, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 13, 1973, Ser. No. 387,988
Int. Cl.[2] F01C *1/10;* **F03C** *3/00;* **F04C** *1/06;* **F16D** *3/18*
U.S. Cl. 418—61 B **7 Claims**



1. A rotary fluid device comprising:

a gerotor set having an externally toothed member eccentrically disposed within an internally toothed ring member to define a plurality of volume chambers by teeth interaction;

valving means for sequentially providing high and low pressure fluid communication to said volume chambers whereby said externally toothed member partakes of hypocycloidal movement with respect to said ring member;

drive connection means for transmitting torque from the rotation of said externally toothed member to an input-output shaft, said drive connection means including said input-output shaft having a first bore axially extending therein from an end thereof and straight spline teeth within a portion of said bore, said externally toothed member having a central opening therethrough with straight spline teeth disposed thereabout and a main drive shaft having crowned spline teeth disposed at its end portions in driving engagement with said straight spline teeth in said input-output shaft and said externally toothed member respectively;

axial positioning means for maintaining said main drive shaft in an axially fixed position with respect to said input-output shaft and said externally toothed member, said positioning means including abutment means for preventing axial movement of said main drive shaft in a first axial direction and biasing means for preventing movement of said shaft in a second axial direction opposite said first direction, said abutment means including a rotatable valve member oppositely disposed about said externally toothed member from said main drive shaft and a crowned spline valve drive shaft in splined engagement with said straight spline teeth in said externally toothed member, said biasing means exerting a greater axial force on said main drive shaft than axial forces exerted on said main drive shaft by the torque developed in said gerotor set.

3,899,271

SLIDING VANE ROTARY COMPRESSOR

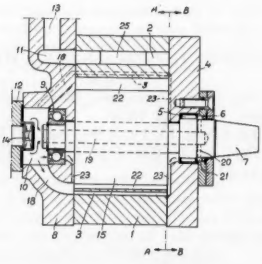
Rune Glanvall, Norrkoping, Sweden, assignor to Stal Refrigeration AB, Norrkoping, Sweden

Filed Sept. 20, 1973, Ser. No. 399,170

Claims priority, application Sweden, Sept. 25, 1972, 12319/72

Int. Cl.[2] F01C *21/04*

U.S. Cl. 418—82 **3 Claims**



1. In a rotary compressor for compressing a gaseous lubricant bearing working medium, means for passing said medium to the moving parts of the compressor, comprising:

a. a stator having a peripheral wall and end walls defining a working chamber and having outlet passage means for the compressed medium;

b. a slotted rotor accommodating a plurality of vanes slidably mounted in the slots thereof for frictionally engaging the walls of said working chamber to compress said medium;

c. said rotor being carried by a rotary shaft the ends of which are journalled in bearings in said end walls and having a channel extending axially therethrough in lubricant communication relationship with said bearings:

d. passage means in said stator for discharging the compressed medium from said working chamber to said outlet passage means in at least one of said end walls;

e. a suction chamber in one of said end walls adjacent the bearing located therein and in lubricating communication therewith;

f. means for supplying said medium to said suction chamber;

g. first passage means for passing said medium from said suction chamber into said working chamber;

h. a space in the end wall opposite to said suction chamber in lubrication relationship with respect to the bearing located in said end wall;

i. second passage means for passing said medium from said space into said working chamber, and

j. third passage means for passing said medium into said working chamber from said suction chamber through the adjacent bearing.

3,899,272

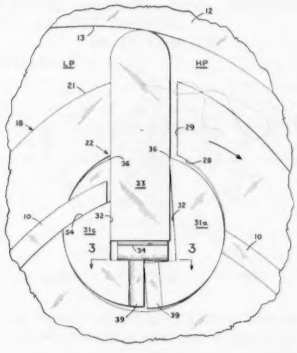
ROTARY MECHANISM HAVING APEX SEALS WITH LOW CONTACT PRESSURE

Winthrop B. Pratt, North Haledon, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed May 13, 1974, Ser. No. 469,594

Int. Cl.[2] F01C *19/02*

U.S. Cl. 418—113 **8 Claims**



1. A rotary mechanism having a housing comprising a peripheral shell having an inner surface and a pair of side walls defining therein a rotor cavity, a shaft journaled by the side walls coaxially with the peripheral shell and having an eccentric portion within the cavity, a rotor having a plurality of apex portions and rotatably mounted on the shaft eccentric portion and defining with the housing a plurality of operating chambers of variable volume wherein gas pressure alternates between lower and higher pressures, wherein the improvement comprises:

a. each rotor apex portion having a radially disposed slot extending in the axial direction from one side of the rotor to the other;

b. a seal strip disposed within the slot and radially movable therein and sweeping the inner surface of the shell in sealing relation, there being an underseal space between the radially inner edge of the seal strip and the bottom of the slot;

c. each rotor apex portion having associated sealing means responsive to gas pressure to restrict entry of gas into the underseal slot space radially inward of the seal strip;

d. the associated sealing means comprising movable means disposed on each side of the apex seal strip and extending in the axial direction and of substantially the same length as the apex seal strip, each movable means having a sealing edge facing the apex seal strip and parallel therewith, the movable means on the side exposed to the oper-

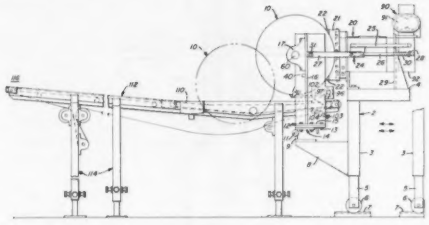
ating chamber having higher pressure being responsive to gas pressure in said chamber to appose its sealing edge to the side of the apex seal strip to occlude the underseal space from entry of gas.

3,899,273

FOOD FORMING APPARATUS

Glen R. Green, Ontario, Oreg., assignor to Ore-Ida Foods, Inc., Boise, Idaho

Filed July 23, 1973, Ser. No. 381,876
Int. Cl. A21c *5/04*
U.S. Cl. 425—62 **15 Claims**



1. In an apparatus for forming shaped foodstuffs, the combination comprising:

a. a frame;

b. a cylindrical molding drum rotatably mounted on the frame and having a series of mold cavities formed therein, each mold cavity being open at the exterior surface of the drum and including a plurality of passageways at and spaced around the base thereof and extending into the interior of the drum;

c. inherently lubricous mold inserts disposed in the respective mold cavities, each insert having a head portion conforming to the configuration of its mold cavity and slidable therein to form an effective sidewall seal, and appendages depending from the head portion and through said passageways, each insert being mounted for controlled reciprocal movement between an extreme retracted position within the mold cavity for receiving foodstuff in the mold cavity and an extreme extended position beyond the mold cavity for discharging shaped foodstuff from the mold cavity;

d. a plenum chamber mounted on the frame for containing foodstuff to be formed and for cooperating with an arcuate portion of the periphery of the drum in sealing relationship therewith, whereby each mold cavity is filled as it passes into communication with the plenum chamber and its mold insert moves into said retracted position;

e. means for rotating the drum so as to bring the mold cavities into and out of communication with the plenum chamber; and

f. means for controllably reciprocating the mold inserts into and out of said retracted and extended positions as the drum rotates into and out of communication with the plenum chamber.

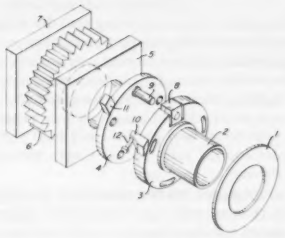
3,899,274

ADJUSTABLE STOP BLOCK FOR TIMING SPINDLE

William L. Lauterbach, Pittsburgh, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 443,263, Feb. 19, 1974, abandoned. This application Nov. 4, 1974, Ser. No. 520,319
Int. Cl. B29c *3/00;* **B30b** *11/16*
U.S. Cl. 425—237 **6 Claims**

1. In a tandem roll briquette mold machine wherein the revolution timing of at least one roll is adjustable to coordinate it with the other roll, the adjustable roll having driving means including a timing sleeve and a coupling, the improvement in the timing adjustment mechanism comprising a flange on said timing sleeve, an adjusting screw mounted on said



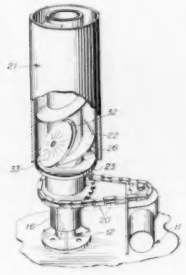
flange, and a stop block mounted on said coupling and adapted to engage said adjusting screw.

3,899,275

ROUNDER FOR DOUGH

Harold T. Atwood, 14152 Irving Ave., Dolton, Ill. 60619

Filed May 28, 1974, Ser. No. 473,687
Int. Cl.[2] A21C *1/14*
U.S. Cl. 425—333 **1 Claim**



1. A rounder for dough comprising a rotatably mounted vertically disposed cylindrical drum, a stationary tubular cylinder housed within said drum, said tubular cylinder having an open upper end and having a portion thereof broken away at its lower end, a vertically disposed spiral ramp projecting outwardly from said cylinder with its outer edge in engagement with the inner wall surface of said drum, said ramp being curved downwardly across its width to move pieces of dough positioned on said ramp into engagement with the inner wall surface of said drum, means for rotating said drum to move pieces of dough positioned on said ramp upwardly along the length of said ramp, and an angularly disposed dispenser plate rotatably mounted adjacent the lower end of said cylinder with the lower portion of its rim in frictional engagement with the bottom wall of said drum whereby rotation of said drum causes said dispenser plate to move pieces of dough dropped through said cylinder on to said ramp.

3,899,276

ANNULAR EXTRUSION DIE WITH BACK PRESSURE CONTROL

Nickolas Sokolow, Roscoe, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed May 29, 1973, Ser. No. 364,523
Int. Cl. B29d *23/04*
U.S. Cl. 425—380 **6 Claims**

1. An extrusion die for making tubing, parisons, and the like, comprising in combination

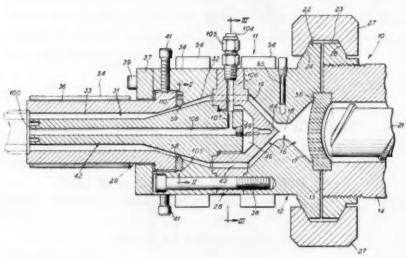
A. a die adapted for mounting in face to face engagement with the face of a prechosen extruder, said die adapter defining therewithin a generally centrally located passageway.

B. an annular spider means adjoining said die adapter, and having radially extending supporting fingers,

C. an elongated die body means circumferentially adjoining said spider means through said supporting fingers, said die body defining therewithin an elongated cavity having a flared cross-sectionally circular entrance portion and a terminal, cylindrical land portion, said land portion having a predetermined ratio of the length thereof to the diameter thereof,

D. elongated mandrel means supported by said spider means and continuously extending within said cavity in radially spaced relationship to said die body to define in combination with said spider means a passageway between said mandrel and said die body means and between said entrance portion and the end of said land portion, said passageway being annular in cross section except in the region of said spider means where the apertures between said supporting finger interconnect with said passageway,

E. said die body means and said mandrel means in combination between said spider means and said land portion defining convergence in said passageway,



F. a choke ring demountably seated on said mandrel means on either said mandrel means or on said die body means between said spider means and said land portion and adapted to reduce circumferentially the cross section of said passageway to a predetermined extent, said choke ring being reversible in position said choke ring being assymetrical as respects a hypothetical centerplane extending through said choke ring perpendicularly to the axis thereof,

G. shoulder means defined in either said mandrel means or said die body means and adapted for so seating said choke ring thereon, as the case may be,

H. the interrelationship between said choke ring and said convergence in said passageway being such that the radial distance between said choke ring and the opposed wall of said passageway has either one of two different values depending upon which way said reversable choke ring is so seated, and

I. mounting means adapted to maintain said die adapter, said spider means, said die body means, said mandrel means, and said choke ring in fixed, predetermined relationship to one another and further adapted to permit at least partial disassembly and reassembly of said mandrel means and said die body means to an extent necessary for mounting and demounting said choke ring from said shoulder means.

3,899,277

MOULDING MACHINES

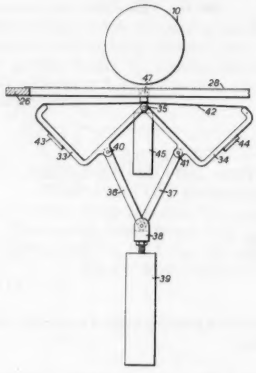
Alan William Winter, Cobham, England, assignor to Bowater Packaging Limited, London, England

Filed Feb. 8, 1973, Ser. No. 330,590

Claims priority, application United Kingdom, Feb. 8, 1972, 5793/72

Int. Cl. B29c *17/00*

U.S. Cl. 425—383 **9 Claims**



1. A moulding machine comprising in combination:

a. a mould cavity

b. a blank-receiving member, and

c. transfer means for transferring a blank of sheet material to the said blank-receiving member,

wherein the transfer means comprises means for supporting the blank at a small distance from the blank-receiving member, means for holding a first part of the blank against the blank-receiving member and means for wrapping the remainder of the blank around the member so that the blank assumes the outer peripheral contour of at least part of the member, the wrapping means including a pair of pivoted arms, an end of each of which arms is operatively engageable with the blank, the blank-receiving member being provided with means for securing the blank to the member after the blank has been transferred to the member by the transfer means and the member being arranged to enter the mould cavity of the machine with the transferred blank secured to it; and wherein the holding means is movable to displace the said first part of the supported blank through said distance and into engagement with the blank-receiving member, and each arm is mounted for pivotal movement about a fixed pivot, pivotal movement of the arms bringing the said ends of the arms which engage the blank towards each other whereby the remainder of the blank extending is opposite directions from the said first part gradually engages the blank-receiving member.

3,899,278

BLOW MOLDING APPARATUS

William A. Fead, Westfield, N.J.; Thomas M. Glynn, Longmeadow, Mass.; Joseph F. Sbarra, Spring Valley, N.Y., and Alfred L. Bower, Lincoln Park, N.J., assignors to American Cyanamid Company, Stamford, Conn.

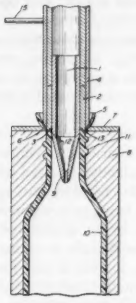
Filed Dec. 17, 1973, Ser. No. 425,354

Int. Cl. B29d *23/03*

U.S. Cl. 425—387 B **1 Claim**

1. An improved apparatus for blow molding a hollow plastic container including separable mold members for enclosing a parison into which air is blown causing the tube to conform to the inner configuration of the mold, the combination of a striker plate in annular form surrounding the neck portion of the container at the top of the mold with a portion of the

parison extending, a hollow blowing mandrel having a cutting sleeve surrounding the lower end of the mandrel, a blow pin sleeve with a serrated surface adjacent to the lower edge and being manually attached at the blow mandrel, and with means for causing rotation of the blow pin sleeve, the cutting edge of the cutting sleeve contacting the striker plate and the serrated surface of the blow pin sleeve contacting the extended portion of the parison with spring load pressure relationship, the blow pin sleeve of the container adapted to be rotated to sever the



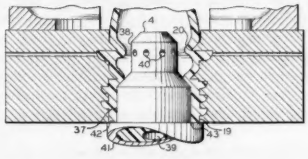
extended portion of the parison from the neck of the container after blowing, the improvement which comprises said cutting sleeve having a flat annular platform extending from the cutting edge before the start of a sealing surface forming edge which extends from above the lower surface, thereby imparting a raised sealing surface to the top of the container above the edge from which the extended portion of the parison has been severed, said edge being below, concentric with and outside of the sealing surface.

3,899,279

BLOW MOLDING APPARATUS

Jimmie E. Hudson, and Jimmie L. Dean, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 15, 1974, Ser. No. 497,621
Int. Cl. B29c *1/00*, *17/07*
U.S. Cl. 425—387 B **8 Claims**



1. A blow mold for forming a container having a neck, said blow mold comprising:

a. means forming a mold portion having a container forming cavity therein with the mold having portions thereof relatively movable between mold open and closed positions;

b. surfaces defining a bore for forming a container neck forming portion of said mold, said bore opening into the cavity of said mold and having a free first end and a second end adjacent said cavity;

c. thread forming grooves in said surfaces for forming threads on one end of a container formed in said mold;

d. a collar forming groove in said surfaces and positioned between said thread forming grooves and said second end for forming a collar on said container neck;

e. a first rib extending outwardly from each of said surfaces into said bore and positioned between said collar forming groove and said thread forming grooves and forming a flow restriction therebetween;

and

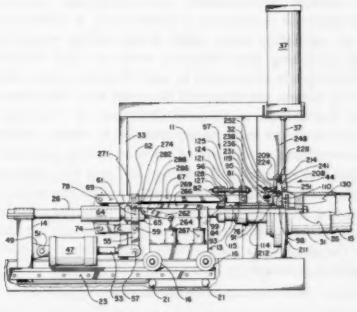
f. a second rib extending outwardly from each of said surfaces into said bore and positioned between said collar forming groove and said second end for restricting movement of container material away from said collar forming groove.

3,899,280

SWAGING UNIT FOR THERMOPLASTIC PIPE

John M. Bailey, Elk River, and Richard C. Longfellow, Long Lake, both of Minn., assignors to The Cretex Companies, Inc., Elk River, Minn.

Filed June 5, 1973, Ser. No. 367,142
Int. Cl.[2] B29C *17/07*
U.S. Cl. 425—393 **18 Claims**



1. In a swaging unit for forming a bell and a gasket groove having an inner diameter in heated thermoplastic piping of the type having

swage mandrel means having a forward end and a rearward end and a circumferential gap therebetween for inserting into the thermoplastic pipe to form a bell on one end thereof;

gasket groove forming means having a portion which may be radially extended through the circumferential gap in the swaging head while the swage mandrel is positioned in the pipe; and

translating means for expanding the gasket groove forming means through the circumferential gap to form the gasket groove in the thermoplastic pipe;

the improvement wherein the gasket groove forming means comprise:

a plurality of nonelastic segments formed from a rigid material the segments being at all times coaxially and circumferentially aligned each with the other, each segment having gasket groove forming edges and being positioned relative to the translating means so that axial movement of the translating means expands the gasket forming portions of the segments radially in continuous coaxial and circumferential alignment through the circumferential gap and into the softened thermoplastic pipe to form the gasket groove in the pipe; and further comprising

control means operatively connected to the translating means to precisely control the extent of translation whereby the outward radial expansion of the segments and thus the inner diameter of the gasket groove so formed is precisely controlled.

3,899,281

VIBRATOR APPARATUS, ESPECIALLY FOR PRODUCING LARGE SHAPED CARBON MEMBERS

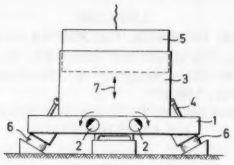
Willy Jakobs, Porz-Grengel, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Filed Mar. 26, 1973, Ser. No. 344,600

Claims priority, application Germany, Mar. 24, 1972, 2214352

Int. Cl. B29b *1/08*; **B29c** *1/16*

U.S. Cl. 425—432 **3 Claims**



1. In vibrator apparatus for producing cast members of granular material comprising a foundation, a vibratory table having an oscillating drive, solid elastic spring means for vibratorily mounting said vibratory table on said foundation, and a molding box connected to said vibratory table; wherein said spring means are disposed between said vibratory table and said foundation so that, in direction of vibration, said spring means are at least partly stressed in shear, said spring means comprising a plurality of pairs of spring members that are inclined at an angle of between 30° and 60° with respect to the plane of said foundation, each of said respective pairs of said spring members forming a spring unit, the members of each pair being mutually inclined symmetrically so that the unit has the shape of a peaked roof, the members of each pair being held in position by force of gravity.

3,899,282

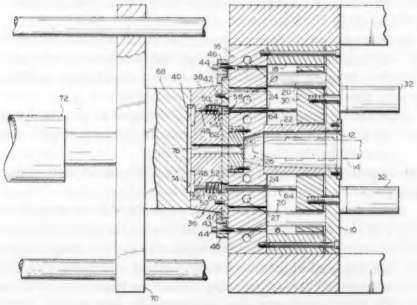
EJECTOR APPARATUS FOR MOLDING MACHINE

Edwin L. Jesse, West Caldwell, N.J., assignor to Evans Products Company, Portland, Oreg.

Filed Mar. 8, 1973, Ser. No. 339,316

Int. Cl. B28b *7/10*

U.S. Cl. 425—444 **7 Claims**



7. In an injection molding machine having a fixed platen and a movable platen for mounting thereon of a core side and a cavity side, respectively, of a mold,

said fixed platen having a plurality of openings therethrough for slidably receiving ejector rods in selected ones of said openings,

an ejector plate mounted rearwardly of said fixed platen for movement toward and away from said fixed platen,

means operatively connected to said ejector plate for moving said ejector plate toward said fixed platen to cause said ejector rods to be extended from the forward surface of said fixed platen,

a core side of a mold mounted on said fixed platen and having in the front surface thereof opposite said fixed platen a cavity defining at least a portion of a part to be injection molded,

said mold core side having a plurality of openings therethrough extending from said cavity to the rear surface abutting said fixed platen, said openings being counterbored from said rear surface,

a plurality of ejector pins mounted one in each of said mold core side openings for sliding movement therein, said ejector pins each comprising an enlarged head slidably received with the counterbore of the corresponding opening,

stop means operatively associated with each of said ejector pins to limit the rearward movement of said pins,

spring means operatively arranged with each of said ejector pins for biasing the head thereof against said stop means, said ejector pins being so positioned that the head of each will be engaged by an ejector rod upon forward movement of the latter thereby to cause forward movement of said ejector pins to eject a part molded in said cavity,

and a plurality of ejector rods arranged within said openings in said fixed platen, there being an ejector rod aligned one with each of said ejector pins.

3,899,283

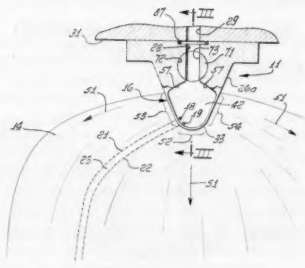
APPARATUS FOR EXTRUDING RESIN FILM WITH WEAKENED TEAR LINES

Marvin E. Wallis, 20741 Horace St., Chatsworth, Calif. 91311

Filed Jan. 15, 1973, Ser. No. 323,992

Int. Cl. B29d *7/04*

U.S. Cl. 425—461 **11 Claims**

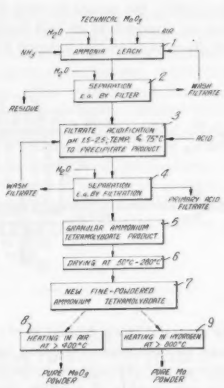


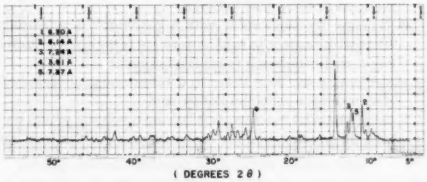
1. A film forming head for extruding a biaxially oriented film with weakened tear line, comprising head structure defining a cavity for receiving viscous resin material under pressure, means including a thin-lip orifice extending about a curvilinear portion of the cavity for extruding a biaxially oriented film that is wider than the orifice, and means for obstructing the flow of said resin outwardly of said orifice during extrusion at a location where the resin flow is bi-directional, whereby the extruded biaxially oriented film is formed with at least one weakened tear line.

3,899,284
FORM OF AMMONIUM TETRAMOLYBDATE AND METHOD OF PREPARATION

Robert W. Stanley, Kirkland, Canada, assignor to Noranda Mines Limited, Toronto, Canada

Filed Aug. 10, 1973, Ser. No. 387,500
Claims priority, application Canada, Apr. 19, 1973, 170022
Int. Cl. C01g 39/00
U.S. Cl. 423—593 20 Claims





1. A new fine-powdered form of ammonium tetramolybdate having an average particle size of up to about 5μ and having 60.65 percent ±0.05 percent by weight of Mo and 5.6 percent ± 0.1 percent by weight of ammonia calculated as NH_4^+, the remainder being oxygen, water of hydration and incidential impurities, and an X-ray diffraction pattern with peaks, by order of importance, at 6.20 Angstroms, 8.14 Angstroms, 7.24 Angstroms, 3.61 Angstroms, and 7.37 Angstroms.

4. Process for the preparation of a fine-powdered ammonium tetramolybdate compound having an average particle size of up to about 5μ which comprises:

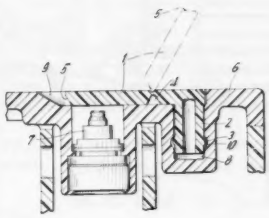
a. subjecting technical grade molybdic oxide to ammonia leach;
b. removing residue from the leach to obtain an ammonium molybdate solution;
c. acidifying said solution at a temperature of up to about 75°C to a pH of about 1.5 – 2.5 to precipitate a granular ammonium tetramolybdate product having an average particle size greater than 5μ;
d. separating said granular product from the acidified solution; and
e. drying said granular product at a temperature of between about 50°C and 280°C to produce the fine-powdered ammonium tetramolybdate compound.

20. Process for converting ammonium tetramolybdate defined in claim **1**, into high purity molybdic oxide having an average particle size of between 2 and 5μ as determined by Fisher Sub-Sieve Sizer, which comprises heating said ammonium tetramolybdate in air at a temperature in excess of 400°C without any associated dissolution or atomization of the product.

3,899,285
CIGARETTE LIGHTER COVER

Ronald Jack Christmas, Leatherhead, England, assignor to Ronson Products Limited, Woodbridge, N.J.

Filed Feb. 21, 1974, Ser. No. 444,557
Claims priority, application United Kingdom, Feb. 23, 1973, 9139/73
Int. Cl.² F23Q 25/00
U.S. Cl. 431—152 6 Claims



1. A cigarette lighter casing comprising a body having a first recess and a cover fitted within and displaceably mounted in said first recess, said first recess having a second recess formed therein extending inwardly into said body from said first recess, said cover comprising an integral molded member formed of plastic material and including a flat planar body portion, a hinge integrally formed in said body portion and dividing it into a first part of said body portion and a second part of said body portion, a protuberance formed on said first part of said body portion and spaced from said hinge and extending generally perpendicularly from said planar body portion, said protuberance being configured to extend in closely fitting engagement to said second recess and to be releasably secured therein so that said first part of said body portion can be held in place on said body and said second part of said body can be pivotally displaced relative to said first part about said hinge, a third recess extending from said first recess and inwardly into said body and having a filling valve therein, said second part of said body portion extending over said third recess in a closed position of said cover.

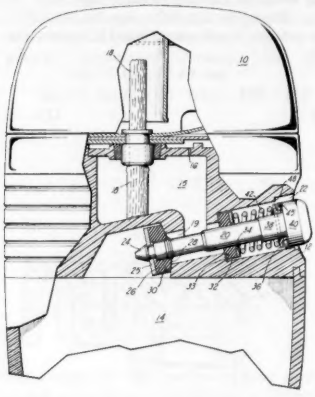
3,899,286
CIGARETTE LIGHTER HAVING ORIENTATION SENSITIVE VALVE ACTUATION MEANS

John C. Lockwood, Atlanta, and Harry L. Vaughan, Lawrenceville, both of Ga., assignors to Scripto, Inc., Atlanta, Ga.

Filed Aug. 23, 1974, Ser. No. 500,043
Int. Cl.² F23D 3/18
U.S. Cl. 431—321 11 Claims

1. A lighter having a housing defining a main fuel reservoir and an auxiliary fuel reservoir in fluid communication with ambient air and with said main fuel reservoir; a wick extending from within said auxiliary fuel reservoir to ambient air; valve means for controlling the flow of fuel between said main fuel reservoir and said auxiliary fuel reservoir; spring means biasing said valve means towards a valve closed position; and valve actuation control means for inhibiting movement of said valve means from said valve closed position to a valve open position when said auxiliary fuel reservoir is not elevated above said

main fuel reservoir and for permitting movement of said valve means from said valve closed position to a valve open position



when said auxiliary fuel reservoir is elevated above said main fuel reservoir.

3,899,287

METHOD OF HEATING METALLIC MATERIAL

Bo Goran Hamrin, Fagersta, and Rune Peterson, Vasteras, both of Sweden, assignors to Granges Engineering Aktiebolag, Vasteras, Sweden

Filed Feb. 27, 1973, Ser. No. 336,353

Claims priority, application Sweden, Feb. 29, 1972, 2543/72

Int. Cl. F27b *5/04, 9/58*

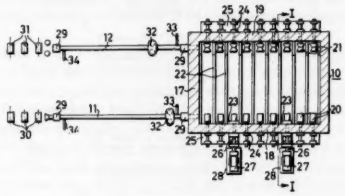
U.S. Cl. 432—23 **2 Claims**

1. A continuous method of heating metallic material in a substantially gas-tight furnace in a manner to substantially avoid changes in the chemical composition of the surface portions of the material, said gas-tight furnace being provided with at least one feed valve, which is held closed against the surrounding atmosphere when placed in communication with the furnace space and which is held closed against the furnace space when placed in communication with the surrounding atmosphere, for feeding the material batchwise into and out of the furnace, the method comprising the steps of:

a. charging the material substantially free from oxygen-containing coatings into the furnace;

b. heating the material in said furnace in the absence of burning fuel within the actual furnace space;

c. maintaining an atmosphere in said furnace space which is substantially in a chemical balance with the composition of the material being heated at the relevant heating temperature by constantly retaining substantially all of the gas forming said atmosphere in the furnace space and by allowing gas capable of reacting chemically with the material to enter the furnace space as said material is fed into and out of the furnace in restricted quantities insufficient to destroy said balance;



d. flushing the feed valve with a gas which is substantially inert with respect to said material at least before discharging a material batch from the furnace;

e. subjecting the feed valve to a subpressure at least before discharging a material batch; and

f. using material batches each having a volume which is only slightly smaller than the cubic capacity of the feed valve.

3,899,288

KERATINIC FIBRES OXIDATION DYEING COMPOSITIONS CONTAINING A CARBONATE OF AN ALKALI METAL AMINO ACID

Jean Galerne, 74 rue de la Folie Regnault, Paris 14°, France

Continuation of Ser. No. 204,379, Dec. 2, 1971, abandoned. This application May 20, 1974, Ser. No. 471,826

Int. Cl. A61k *7/12*

U.S. Cl. 8—10.2 **9 Claims**

1. A composition for dyeing keratinic fibres and human hair comprising an aqueous mixture containing about 0.2 to 15 wt. % of an oxidation dyestuff precursor selected from the group consisting of p-phenylenediamine, p-toluylenediamine, m-toluylenediamine, nitro p-phenylenediamine,2,4 - diamino anisol sulfate, p-N-methylamino phenol sulfate, resorcinol, hydroquinone and mixtures thereof and about 1 to 10 wt. % of a carbonate of an alkali metal salt of an amino acid as an alkalizer, said amino acid being selected from the group consisting of glycine, lysine, methionine, tyrosine, glutamic acid, leucine, valine and alanine, and said alkali metal being selected from the group consisting of sodium, potassium and lithium.

3,899,289

TREATMENT OF COTTON WITH GLYCIDYL METHACRYLATE USING IONIZING RADIATION

Ralph J. Berni, Metairie, and James A. Harris, Pearl River, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 309,833, Nov. 27, 1972, abandoned. This application Apr. 15, 1974, Ser. No. 461,182

Int. Cl.² D06M *13/00*

U.S. Cl. 8—120 **1 Claim**

1. A process for imparting durable press with "ease in processing" comprising:

a. slack mercerizing a cotton or other cellulosic textile, rinsing and neutralizing with dilute acetic acid,

b. reacting the wet mercerized textile by impregnation with a 1 Molar sodium methoxide solution in methanol to yield the sodium cellulosate,

c. washing the sodium cellulosate free of unreacted sodium methoxide with tertiary butyl alcohol,

d. immersing the wet fabric of (c) in 60% solution of glycidyl methacrylate in tertiary butanol to react for 1 hour at about 70°C, and washing and drying the reacted cellulosate,

e. irradiating the dry fabric of (d) to 1 megarad with a cobalt 60 gamma radiation source, and

f. contacting the textile with a 50% watermethanol-glycidyl methacrylate solution, then washing with water, and drying.

3,899,290

FABRIC WATERPROOFING PROCESS

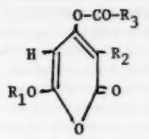
Edward S. Rothman, Glenside, Pa.; Stephen S. Hecht, Princeton, N.J., and Gordon G. Moore, Willow Grove, Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 28, 1974, Ser. No. 473,476

Int. Cl.² D06M *13/20*

U.S. Cl. 8—120 **5 Claims**

1. A process for waterproofing fibrous cellulosic and fibrous proteinaceous materials comprising immersing the material to be waterproofed in a solution of an α-pyrone of the formula



in which R_1 is methyl, ethyl or propyl, and R_2 and R_3 are long chain alkyl groups containing from 12 to 17 carbon atoms.

3,899,291

PROCESS FOR THE SEMI-CONTINUOUS DYEING OF SYNTHETIC TEXTILE ARTICLES

Hans-Ulrich von der Elitz, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 26, 1973, Ser. No. 344,968

Claims priority, application Germany, Mar. 29, 1972, 2215297

Int. Cl.² D06P *5/00*

U.S. Cl. 8—174 **3 Claims**

1. In a process for the semi-continuous fixation of heat-fixable dyestuffs upon flat structures made from texturized polyester fibers, wherein a textile material that has been padded or printed with a dyestuff and an adjuvant is wound up on a perforated cylinder and said cylinder loaded with the textile material is placed in the form of a skein into a pressure vessel, the improvement which comprises: reducing the pressure in said pressure vessel to less than atmospheric pressure; introducing into said pressure vessel liquid water at a temperature of 110° to 135°C, substantially free of dyestuffs and other adjuvants; and permitting the heated water to act upon the dyestuffs padded or printed upon the textile material, thereby exploiting the pressure difference between the water introduced into and the textile material in the pressure vessel.

3. In a process for the semi-continuous fixation of heat-fixable dyestuffs upon flat structures made from texturized polyester fibers, wherein a textile material that has been padded or printed with a dyestuff and an adjuvant is wound up on a perforated cylinder and said cylinder loaded with the textile material is placed in the form of a skein into a pressure vessel, the improvement which comprises: introducing liquid water under superatmospheric pressure and at a temperature of 110° to 135°C to said pressure vessel, the interior of which is under normal atmospheric pressure.

3,899,292

PROCESS FOR CRUMPLING SYNTHETIC SUEDE

Kaoru Okazaki, Otsu; Kenkichi Yagi, Kyoto; Miyoshi Okamoto, Takatsuki; Koji Watanabe, Otsu; Toyohiko Hikota, Godocho, and Masayoshi Kubo, Kusatsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 6, 1973, Ser. No. 338,565

Int. Cl. D06p *7/00*

U.S. Cl. 8—17 **18 Claims**

1. A process for preparing synthetic suede, said suede comprising a napped needle-punched fabric comprising a multiplicity of fibers of superfine denier into which polyurethane is impregnated, said process comprising repeatedly crumpling said napped sheet by passing it together with a dye liquid through an area of reduced cross-section according to the relationships:

$$<2 \; S/A < 22 \qquad (1)$$

and

$$<10 \; S <300 \; (cm^2) \qquad (2)$$

wherein S is the reduced cross-sectional area and A is the cross-sectional area of the napped sheet (cm^2), said napped

sheet having naps of superfine denier fiber on at least one surface thereof and having a thickness of about 0.2–4.0 mm and a width of about 5–200 cm, and comprising (a) nonwoven fabric made up of 0.1–0.3 denier superfine staple fibers having a breaking strength of below 3 grams and an elongation at break of 60–180 percent, said fibers being adhered to (b) a polyurethane elastomer comprising the reaction product of a diol mixture consisting essentially by weight of 20–40 parts of polycaprolactone diol having a molecular weight of about 1000– 3000 and 60–80 parts of polytetramethyleneetherglycol having a molecular weight of about 1000–3000 with an organic diisocyanate and a diamine chain extender and repeatedly contacting the suede with the dye liquid after the suede emerges from the said area of reduced cross-section.

3,899,293

METHOD FOR INHIBITING THE CORROSION OF IRON AND ALLOYS THEREOF IN AN AQUEOUS ENVIRONMENT WITH SULFITE COMPOSITIONS

Harley E. Bush, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Aug. 28, 1973, Ser. No. 392,344
Int. Cl.[2] C09K *15/02, 15/32;* **C23F** *11/16, 11/18*
U.S. Cl. 21—2.7 A **12 Claims**

1. In a method of inhibiting the corrosion of iron and alloys thereof in contact with an aqueous system containing dissolved oxygen and a metallic cation selected from the group consisting of ferrous, cobaltous, nickelic, manganous, cupric, and mixtures thereof, comprising adding to said system an aqueous sulfite solution containing a sulfite compound selected from the group consisting of alkali metal sulfites, alkali metal bisulfites, ammonium sulfites, ammonium bisulfites, and mixtures thereof, in an amount sufficient to provide a residual sulfite ion concentration in said system of from 20 to 100 ppm after said added sulfite compound and said oxygen have reacted, and wherein the concentration of said cation is sufficient to catalyze the reaction of said sulfite compound and said oxygen, the improvement which comprises:

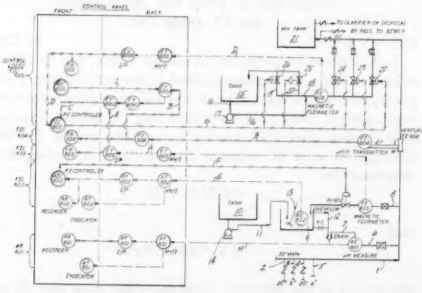
adding to said aqueous system an aqueous sulfite solution, said sulfite solution being composed of from 5% up to saturation of said sulfite compound, and a water soluble organic polyphosphonate containing at least two phosphonic acid groups per molecule, said polyphosphonate being present in a concentration of from 1–20% by weight of said sulfite compound in order to inhibit the reaction of said sulfite compound with atmospheric oxygen.

3,899,294

METHOD FOR AUTOMATIC FEED FORWARD CONTROL OF EFFLUENT pH

Peter G. Magiros, Houston, Tex., assignor to Olin Corporation, New Haven, Conn.

Filed July 18, 1974, Ser. No. 488,620
Int. Cl.[2] G05B *13/02;* **G05D** *21/02*
U.S. Cl. 23—230 A **10 Claims**



1. A feed forward method for automatically controlling the pH of effluent stream comprising:

a. continuously titrating upstream a slip stream of said effluent to a pH corresponding to a selected set point on a pH controller having proportional and integral response with a titrating stream of rapidly reacting neutralizing agent, the flow of either said slip stream or said titrating stream being constant while the flow of the other is automatically regulated;

b. continuously monitoring the instantaneous flow rate of the stream whose flow rate is automatically regulated and transmitting a signal A, corresponding to the flow rate of said regulated stream; c. continuously monitoring the instantaneous flow rate of said effluent stream and transmitting a signal B corresponding to the flow rate of said effluent stream;

d. conditioning signals A and B to automatically provide a signal C producing a variable set point on a dilution controller, said set point controlling the instantaneous flow rate of a stream of neutralizing agent to be added to said effluent stream to produce an outfall pH substantially corresponding to the pH represented by said selected set point.

3,899,295

INTEGRITY INDICATOR

Donald F. Halpern, Whitestone, N.Y., assignor to Bio-Medical Sciences, Inc., Fairfield, N.J.

Filed Nov. 23, 1973, Ser. No. 418,486
Int. Cl. B65b *31/02;* **G01n** *31/22*
U.S. Cl. 23—253 TP **5 Claims**

1. A visual package integrity indicator comprising a normally sealed package, a sensor means in communication with the interior of said package and visible from the exterior of said package, said sensor means including a pH sensitive dye system which displays a first color at normal atmospheric pH and a second color slightly above said normal atmospheric pH, and an artificial atmosphere within said package containing a quantity of basic gaseous material in a quantity sufficient to maintain said dye system in its second color when said package is sealed; the color of said dye system being reversibly responsive to the presence or absence of said gaseous material thereby indicating damage to the integrity of said normally sealed package.

3,899,296

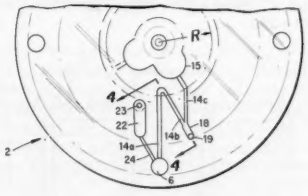
WHOLE BLOOD ANALYSIS ROTOR FOR A MULTISTATION DYNAMIC PHOTOMETER

James C. Mailen, Oak Ridge, and Wayne F. Johnson, Loudon, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 17, 1974, Ser. No. 489,305
Int. Cl.[2] B04B *5/12;* **G01N** *33/16, 21/00, 1/10*
U.S. Cl. 23—259 **5 Claims**

1. An improved rotor for a photometric solution analyzer of the rotary cuvette type suitable for use in analyzing whole blood samples comprising a generally disk-shaped member defining:

a. a plurality of sample analysis cuvettes disposed in a circular array for receiving liquid samples and reagents, said disk-shaped member having transparent walls adjacent said sample analysis cuvettes for permitting the passageway of light therethrough;
b. a centrally located static loading chamber having a loading port for receiving gross whole blood samples;
c. a central fluid transfer cavity in open communication with the outside of said disk-shaped member;
d. a continuous annulus positioned on a radius intermediate said cuvettes and said static loading chamber;
e. at least one first passageway communicating between said annulus and said static loading chamber;
f. at least one overflow chamber positioned intermediate said annulus and said static loading chamber;
g. at least one second passageway communicating between said annulus and said at least one overflow chamber;



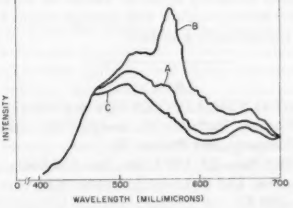
h. a plurality of third passageways each of which is radially folded to form three radially extending interconnected passageway segments; a first segment extending radially from a respective sample analysis cuvette to a point centripetal to said overflow chamber, a second segment extending from the centripetal end of said first segment to a radius about equal to that of said annulus, and a third segment extending from the centrifugal end of said second segment to said central fluid transfer cavity;
i. a plurality of connecting passageways extending between said annulus and the centrifugal ends of respective second and third segments of said third passageways;
j. a magnetically actuated ball trap valve disposed in each of said connecting passageways; and
k. means for injecting reagents into said sample analysis cuvettes.

3,899,297

BIOLOGICAL STAINING TECHNIQUE AND MIXTURE THEREOF

Tomas Hirschfeld, Framingham, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

Filed Dec. 19, 1973, Ser. No. 426,088
Int. Cl.[2] G01N *21/20, 33/16;* **C09B** *69/00*
U.S. Cl. 23—230 B **13 Claims**



1. Method of characterising an unknown organic chemical compound, said method comprising,

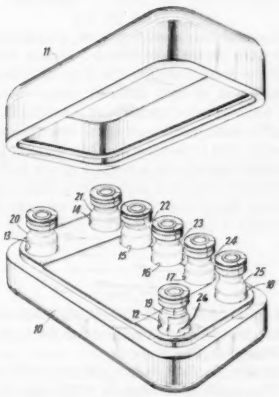
staining said compound simultaneously in an equilibrium process with a mixture of at least two chemically compatible dyes each of which binds to said compound with a different binding energy said dyes being selected and in sufficient amount in said mixture so that when bound to said compound each dye provides spectral characteristics to the dyed compound sufficient to permit detection of the spectral characteristics of said dyed compound due to the other of said dyes;
exciting a spectral response in the dyed compound;
observing said spectral response at least at two different wavelength bands in the spectrum of said response, and comparing the intensities observed at said bands to obtain a value characteristic of the difference in the binding energies of said dyes to said compound.

3,899,298

METHOD AND APPARATUS FOR ANGIOTENSIN I DETERMINATION

Raymond A. Szczesniak, Kendall Park, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 11, 1972, Ser. No. 242,956
Int. Cl. G01n *33/16*
U.S. Cl. 23—253 R **3 Claims**



1. Apparatus for determination of Angiotensin I comprising a carrier being compartmented to receive at least three vials and to maintain said vials in close confinement, a first vial comprising an acetic acid solution containing about 10 picograms of Angiotensin I per microliter, a second vial of Angiotensin I antiserum, and a third vial comprising an aqueous solution of ^{125}I Angiotensin I having a total activity of about 20 microcuries, and having therein a strip of paper, said paper impregnated with an anion exchange resin.

3,899,299

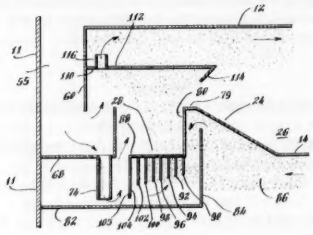
EXTRACTION APPARATUS

James D. Bushnell, Berkeley Heights, and Robert J. Fiocco, Summit, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed May 21, 1973, Ser. No. 362,489
Int. Cl. B01d *11/04, 59/24*
U.S. Cl. 23—270.5 **9 Claims**

1. In a vertical separating tower wherein first and second partially immiscible liquids of relatively high and low density respectively are charged to the tower and contacted thereby separating said liquids into a relatively light raffinate phase and a relatively heavier extract phase, said tower having a plurality of vertically spaced trays, a space between said trays wherein said raffinate phase settles into a layer which flows

beneath a lower surface of said trays and said extract phase settles into a layer which flows above an upper surface of said trays and downcomer means associated with each tray for providing a flow path for said first liquid or said extract phase from a location above a tray to a location beneath said tray and riser means associated with each tray for providing a flow path for said second liquid or raffinate phase from a location beneath a tray to a location above said tray, said riser means being horizontally spaced apart from said downcomer means and said riser means further comprising a seal box means adapted for laterally separating the space above a tray into a



dispersing zone and into a settling zone, said seal box means including aperture means comprising a surface having a plurality of apertures formed therein for more effectively dispersing said light liquid or said raffinate phase passing therethrough, the improvement comprising a horizontally extending striker baffle plate positioned in the intertray space above said riser means, said striker baffle plate including means for the flow therethrough of only a portion of the raffinate phase which flows through the riser means from below, said striker plate including a flange segment forming an edge thereof and extending toward a principal bodied portion of the striker plate.

3,899,300

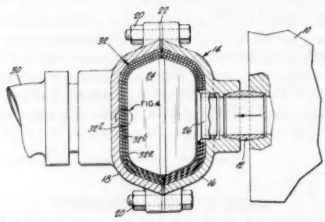
THERMALLY INSULATED EXHAUST GAS REACTOR

George D'Olier, Devon, Conn., assignor to Raybestos-Manhattan, Inc., Trumbull, Conn.

Division of Ser. No. 247,445, April 28, 1972, Pat. No. 3,821,063. This application Mar. 8, 1974, Ser. No. 449,475

Int. Cl. B01j *9/04;* **F01n** *3/00;* **F23g** *7/06*

U.S. Cl. 23—277 C **5 Claims**



1. An emission control device for converting atmospheric pollutants in the exhaust gas of an internal combustion engine to non-polluting forms comprising a reaction chamber of heat and corrosion resistant material, means for conducting internal combustion engine exhaust gas through said reaction chamber, container means surrounding and supporting said reaction chamber, and insulating means disposed between said reaction chamber and surrounding container means comprising at least two superimposed layers of an asbestos sheet in direct contact with one another, each of said layers of said sheet material comprising from about 75 to about 90 percent by weight of chrysotile asbestos fibers, from about 10 to about 20 percent of an elastomeric binder comprising a copolymer of butadiene having a molecular weight of from about 150,000 to about 200,000 and from about 0 to about 10 percent of filler, the major portion of said asbestos fibers being oriented in a generally parallel relation with each other within said sheet, said sheet having been heat treated at a temperature of from about 525°to about 575°F., for a period of time to cause a weight reduction in said sheet of from about 8 to about 10 percent and to effect cracking of said elastomeric binder.

3,899,301

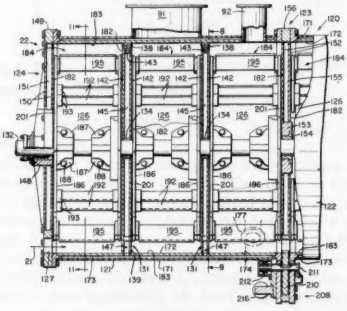
CONTINUOUS RENDERING APPARATUS

Dean K. Bredeson, Piqua, Ohio; John R. Harrison, Camden, S.C., and Earl A. N. Johnson, Edmonds, Wash., assignors to The French Oil Mill Machinery Company, Piqua, Ohio

Filed Apr. 24, 1972, Ser. No. 246,749

Int. Cl. B01d *43/00;* **B01j** *3/00;* **C11b** *1/12*

U.S. Cl. 23—280 **24 Claims**



1. A cooker for a continous rendering system comprising,

a housing having a cylindrical heating surface extending along substantially its full length and having a pair of opposed ends,

an inlet through one of said ends of receiving comminuted animal products,

an outlet through the other of said ends for discharging said products after cooking thereof,

at least one partition arranged between said ends and in fixed relationship to said housing,

said partition having a pair of opposed planar heating surfaces,

and dual-purpose means rotated within said housing for stirring comminuted particles during cooking thereof and simultaneously scraping both said cylindrical and said planar heating surfaces to prevent sticking and accumulation of products against said cylindrical and said planar surfaces to thereby cause efficient cooking, said dual-purpose means including separate means for scraping said cylindrical heating surface and separate means for scraping said planar heating surface.

3,899,302

CATALYTIC CONVERTER HOUSING

Melvin H. Wagner, Bartlett, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

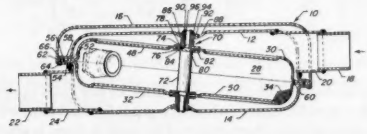
Filed Nov. 23, 1973, Ser. No. 418,646

Int. Cl.[2] B01J *8/02;* **F01N** *3/15*

U.S. Cl. 23—288 F **2 Claims**

1. A catalytic converter assembly comprising a metal housing including a inlet housing cover portion and a metal outlet housing cover portion; a particulate catalyst retaining bed portion including a chamber defined by a pair of facing, dished, perforated metal inlet and outlet members; said pair of

dished members having peripheral, joined together, radially extending flange portions; each of said cover portions having peripheral flanges which extend radially beyond, and slidably engage, the flange portions on said dished members; at least one of said cover portions having an axially extending flange portion which is welded to the other cover portion at a location spaced radially outwardly of the flange portions of said dished members; said bed portion being free to slide in the plane of said flange portions in response to temperature differences between the metal housing and the bed portion; at least one spacer pin passing through said housing cover portions and said perforated members; said spacer pin having shoulder



portions spaced inwardly from its ends limiting movement of said perforated members toward each other; the end portions of said spacer pin projecting through apertures larger than said end portions which are formed in said housing cover portions; the cover portions being generally concavely shaped in the immediate area surrounding said pin ends; and retaining means on the ends of said at least one pin for preventing said cover portions from moving away from each other, a portion of said retaining means being shaped in a manner complementary to said concave shaped cover area so as to permit said retaining means to slide relative to said cover portion and said pin to pivot.

3,899,303

APPARATUS FOR THE CATALYTIC PURIFICATION OF EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

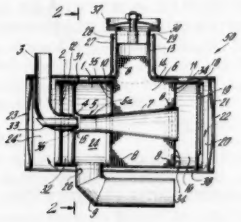
Gerhard Gaysert, Berkheim, Germany, assignor to J. Eberspacher, Germany

Filed Mar. 5, 1973, Ser. No. 337,947

Claims priority, application Germany, May 5, 1972, 2221970

Int. Cl. F01n *3/10, 3/14*

U.S. Cl. 23—288 F **5 Claims**



1. An apparatus for purifying exhaust gases, comprising a housing having an intermediate catalytic material chamber with a first chamber and a second mixing and reversing chamber on respective sides thereof, first and second perforated partitions in said housing on each side of said catalytic material chamber dividing said intermediate chamber from said first and second chambers but permitting the flow of gases therethrough, an aspiration tube having an inlet located in said first chamber and extending through said catalytic material chamber into said second chamber for the flow of exhaust gases from said first chamber into said second chamber, an exhaust gas delivery pipe connected into said first chamber and having a discharge terminating adjacent said aspiration tube inlet leaving a combustion air flow space between said exhaust gas delivery pipe and said aspiration tube for the inflow of air along with the exhaust gases, means to deflect the exhaust gases and air backwardly from said second chamber back through said catalytic chamber for treatment in said catalytic chamber and for flow to said first chamber, a gas discharge in said first chamber for the discharge of the treated exhaust gases, wall means connected to said aspiration tube inlet and dividing said first chamber into an exhaust chamber which is adjacent said intermediate chamber and connected to said gas discharge, a third perforated partition spaced from said wall means, an inlet chamber located between said third perforated partition and said wall means, and combustion air supply means to supply combustion air through said third perforated partition into said inlet chamber, said exhaust gases in their passage from said exhaust gas delivery pipe into said aspiration tube inlet being cooled by the combustion air and acting to draw the combustion air into said inlet and through said aspiration tube for flow therethrough and into said second mixing and reversing chamber and then backwardly through said catalytic material chamber.

3,899,304

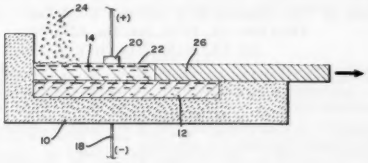
PROCESS OF GROWING CRYSTALS

Robert C. Linares, Warren Twp., Somerset County, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed July 17, 1972, Ser. No. 272,270

Int. Cl. B01j *17/20*

U.S. Cl. 23—301 SP **12 Claims**



1. A process for growing ionic crystals comprising

a. providing a molten support comprising a metal selected from the group consisting of tin, lead, platinum, aluminum, rhodium, iridium, molybdenum, tantalum, gallium, copper, gold, silver, tungsten and indium,

b. floating a melt of an ionic material selected from the group consisting of refractory oxides on said molten support, said molten support being immiscible with said ionic material,

c. maintaining at least a portion of said molten support at a temperature of at least the melting point of said ionic material,

d. growing a crystal from said ionic molten material while said material is supported on said molten support by reducing the temperature of said ionic molten material below its melting point, and

e. removing the grown crystal from said molten support.

3,899,305

INSERT FRAME FOR INSERT MOLDING

Raymond H. Hilgers, Schaumburg, and James P. Liautaud, Trout Valley, both of Ill., assignors to Capsonic Group, Inc., Elgin, Ill.

Filed July 23, 1973, Ser. No. 381,405

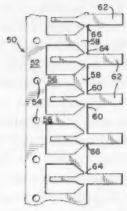
Int. Cl. B21c *37/00*

U.S. Cl. 29—193 **12 Claims**

1. An integral insert frame for use in molding a plurality of terminals into the wall of an injection molded housing, said frame comprising, in combination:

a plurality of elongated spaced-apart terminal portions arranged for insertion at spaced locations through said wall;

a plurality of barrier portions extending between adjacent ones of said terminal portions and attached thereto by means of frangible bridging portions; and



means including a carrier portion attached only to each of said barrier portions for maintaining said barrier portions in fixed spatial relationship whereby said terminal portions are aligned for insertion into said housing wall.

3,899,306

EXOTHERMIC BRAZING OF ALUMINUM

Walter V. Knopp, Wyckoff, and Paul J. Cascone, Haledon, both of N.J., assignors to A. Johnson & Co. Inc.

Filed Dec. 21, 1973, Ser. No. 427,366
Int. Cl.[2] B23P *3/14, 3/10*
U.S. Cl. 29—197 **8 Claims**

1. A fluxless brazed aluminum joint comprising two abutting aluminum surfaces bonded together by virtue of the presence of nickel at said abutting surfaces in the form of an exothermic nickel-aluminum reaction product.

2. A method for the fluxless brazing of aluminum parts which comprises,

abutting selected surfaces of said aluminum parts tightly together with a layer of finely divided metallic nickel brazing powder disposed at the interface thereof,

and then heating the assembled parts to a temperature within the range of about 1000°F and 1200°F but below the melting points of said parts,

whereby an exothermic reaction is effected at the interface of said parts between the finely divided metallic nickel powder layer and the selected abutting aluminum surfaces to form a strong fluxless brazed joint of the parts.

3,899,307

RESIN BONDED DIAMOND WHEELS WITH COPPER AND SILICON CARBIDE FILLERS

John R. Thompson, Westboro, Mass., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 88,502, Nov. 10, 1970, abandoned, which is a continuation-in-part of Ser. No. 812,453, April 1, 1969, abandoned, which is a continuation-in-part of Ser. No. 542,724, April 15, 1966, abandoned. This application Jan. 2, 1974, Ser. No. 429,996
Int. Cl.[2] C08J *5/14;* **E09K** *3/14*
U.S. Cl. 51—298 **3 Claims**

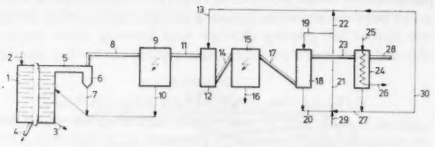
1. An abrasive grinding wheel having a relatively soft grinding grade comprising from 20 to 70% copper powder, from 5 to 45% silicon carbide filler, from 10 to 25% of a synthetic binder selected from the group consisting of a thermosetting polymer or linear aromatic polymer resin and from 3 to 30% diamond abrasive, the copper powder being in excess of 25% but less than 100%, by volume, of the silicon carbide filler, said copper powder and silicon carbide filler being finer than the diamond abrasive.

3,899,308

GAS PURIFICATION METHOD

Stig Arvid Petersson, Skelleftehamn, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed Apr. 26, 1974, Ser. No. 464,465
Claims priority, application Sweden, May 2, 1973, 7361012
Int. Cl. B03c *3/01*
U.S. Cl. 55—8 **5 Claims**



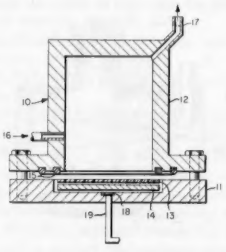
1. A process of selective purification of hot gases containing complex metallic dust in which the gas is first led to an electrostatic precipitator where material in particle form is separated after which the gas in a first cooling step undergoes a cooling and thereafter is caused to pass a second electrostatic precipitator and in a washing step is washed with water and finally, in a second cooling step undergoes an indirect cooling, characterized in that the hot gases in the first cooling operation are cooled by means of vapourization of injected water in such a maximum quantity that the heat present in the gas is sufficient to vapourize completely the added water and that the added water is derived from the water washing step and from condensation in the second cooling step, so that in the products condensed in the first cooling step and those separated in the water washing step are obtained in the second electrostatic precipitator in a dry condition.

3,899,309

AROMATIC POLYIMIDE, POLYESTER AND POLYAMIDE SEPARATION MEMBRANES

Harvey Herbert Hoehn, Hockessin, Del., and John W. Richter, Kennett Square, Pa., assignors to E. I. du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 273,802, July 20, 1972, abandoned. This application Jan. 11, 1973, Ser. No. 322,800
Int. Cl. B01d *53/22, 31/00*
U.S. Cl. 29—16 **29 Claims**



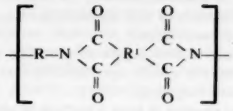
1. The process of separating fluids using a semipermeable membrane of which at least 50% by weight consists essentially of a polymer whose main chain has a repeating unit containing at least one group selected from the group consisting of aromatic imide, aromatic ester and aromatic amide groups, in which said repeating unit

a. contains at least one rigid divalent subunit, the two main chain single bonds extending from which are not colinear,

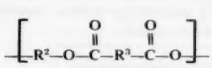
b. is sterically unable to rotate 360° around one or more of said main chain single bonds, and

c. has more than 50% of its main chain atoms in aromatic groups,

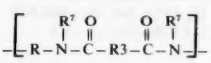
the said aromatic imide repeating unit having the formula



wherein R and R^1 are, repsectively, a divalent and tetravalent organic radical, the said aromatic ester repeating unit having the formula



wherein each of R^2 and R^3, alike or different, is a divalent organic radical, and the said aromatic amide repeating unit having the formula



wherein R and R^3 are as defined above and R^7 is hydrogen, lower alkyl or phenyl.

3,899,310

ALUMINA-ZEOLITE COMPOSITE ADSORBENTS FOR REFRIGERANTS

Donald G. Chi, and Hanju Lee, both of Columbia, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Mar. 20, 1974, Ser. No. 452,718

Int. Cl.[2] B01D *53/04*

U.S. Cl. 55—71 **7 Claims**

1. A method for removing fatty acid contaminants from a halocarbon refrigerant gas comprising contacting said gas with a composite alumina-zeolite adsorbent formed from blended zeolite and alumina powders, said zeolite component having a pore diameter of 3 to 6 angstroms and comprising 20 to 80 percent by weight of said composite and the remainder being alumina.

3,899,311

RECOVERY OF POWDER IN AN ELECTROSTATIC POWDER SPRAYING OPERATION

Herbert Rapp, Karlstr. 52, 7410 Reutlingen, Germany

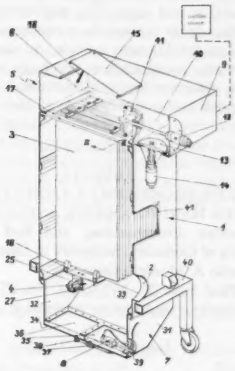
Filed Apr. 18, 1973, Ser. No. 352,298

Claims priority, application Germany, Apr. 20, 1972, 2219314; Mar. 14, 1973, 2312560

Int. Cl. B01d *46/08*

U.S. Cl. 55—283 **20 Claims**

1. A powder recovery apparatus for use in EPS installations, comprising a filter chamber having an inlet portion and an outlet portion; filter means in said filter chamber intermediate said inlet and outlet portions thereof for intercepting powder particles from a gas stream admitted through said inlet portion; collecting means beneath said filter means; vibrating means operatively connected with said filter means for vibrating said filter means so as to release intercepted powder particles for collection of the same by said collecting means; a source of suction; a suction channel interposed between and communicating with said source and said outlet portion, said suction channel having an intake port for ambient air at atmospheric pressure from the exterior of the apparatus; first valve means between said outlet portion and said suction channel to open and close said outlet portion to suction; second valve means in said intake port; and control means connected to said valve means for displacing said first and second valve means between closed and open positions thereof so that said source draws said gas stream into and through said filter chamber and said suction channel when said first valve means is in said open position thereof with attendant interception of the powder particles from said gas stream by said filter means, whereas ambient air from the exterior of the apparatus is drawn by the source into said suction channel through said



intake port when said second valve means is in said open position thereof and while said first valve means is in said closed position thereof with attendant interruption of the passage of gas stream through said filter chamber.

3,899,312

EXTRACTION OF ODORIZING SULFUR COMPOUNDS FROM NATURAL GAS AND REODORIZATION THEREWITH

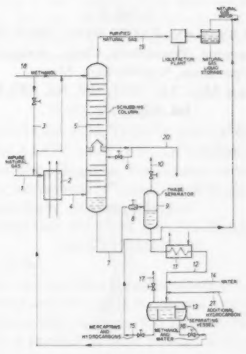
August Kruis, and Heinz Karwat, both of Pullach, Germany, assignors to Linde Aktiengesellschaft Zentrale Patentabteilung, Munich, Germany

Filed Aug. 18, 1970, Ser. No. 64,757

Claims priority, application Germany, Aug. 21, 1969, 1942639

Int. Cl. F25j *3/00*

U.S. Cl. 62—17 **17 Claims**



1. In a natural gas liquefaction process comprising prior to the step of liquefying the natural gas, the preliminary steps of scrubbing the natural gas with a polar organic scrubbing agent to remove odiferous organic sulfur compounds therefrom and then in a separating step, adding water to resultant loaded scrubbing agent to form an aqueous phase and a hydrocarbon

phase, the latter phase including hydrocarbons scrubbed out with said organic sulfur compounds, said organic sulfur compounds being distributed in both the aqueous and hydrocarbon phases, then liquefying and storing the scrubbed natural gas, and revaporizing same during demand periods,

the improvement comprising adding additional liquid hydrocarbon, in said separating step, to said loaded scrubbing agent, in an amount to remove said organic sulfur compounds substantially completely and to transfer said organic sulfur compounds to said hydrocarbon phase, and recycling resultant liquid hydrocarbon phase containing said organic sulfur compounds to the scrubbed natural gas.

3,899,313

METHOD OF PRODUCING A LIGHT CONDUCTING FIBER HAVING A CORE AND A CASING

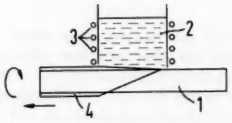
Josef Grabmaier, Unterhaching, and Rolf Plaettner, Ottobrunn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 27, 1973, Ser. No. 374,017

Claims priority, application Germany, July 13, 1972, 2234521

Int. Cl. C03c *25/02*

U.S. Cl. 65—3 **1 Claim**



1. A method for producing a light conducting fiber consisting of a core formed of a quartz glass doped with TiO_2 and a surrounding casing formed of relatively pure quartz glass, whereby the refractive index of the casing is lower than that of the core, comprising the steps of: heating the core to a temperature which is slightly below its fusing temperature, immersing the core into a melt of relatively pure quartz glass, and withdrawing the core therefrom, said immersing being carried out at a reduced pressure relative to atmospheric pressure, said immersion being carried out by pulling said core beneath and in contact with said melt in a horizontal direction while simultaneously rotating said core about its longitudinal axis.

3,899,314

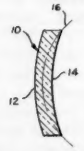
LENS MANUFACTURING PROCESS

Walter P. Siegmund, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Mar. 18, 1974, Ser. No. 452,177

Int. Cl. C03c *19/00*

U.S. Cl. 65—23 **10 Claims**



1. The method of making a glass article having at least one finished surface of ophthalmic quality comprising the steps of: forming a first layer of glass of the type desired of said article, said first layer being of at least the length, width and thickness desired of said article;

covering at least one side of said first layer of glass with a second relatively thin layer of a removable glass during one stage of the forming of said first layer and fusing the covering layer of glass interfacially to said first layer of glass, the combination of said layers of glass constituting a preform of said article;

flattening said preform to a degree of precision producing a finish of ophthalmic quality upon said first layer of glass adjacent said covering layer;

heat softening and shaping at least a portion of said preform to at least the approximate shape desired of said article; and

removing said covering layer of glass from said portion of said preform to expose the underlying surface of said first layer of glass, said underlying surface constituting said finished surface of said article.

3,899,315

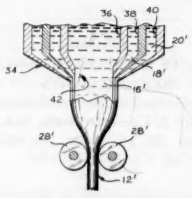
METHOD OF MAKING GLASS CLAD GLASS LENSES

Walter P. Siegmund, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 15, 1974, Ser. No. 460,845

Int. Cl. C03b *19/00, 11/08*

U.S. Cl. 65—23 **5 Claims**



1. The method of making a glass clad ophthalmic lens comprising the steps of:

forming a first thick layer of glass of the type desired of the major portion of said lens, said glass having a predetermined index of refraction and coefficient of expansion and said layer being of at least the length, width and thickness desired of said lens;

covering at least on side of said first layer of glass with a second relatively thin layer of a second glass having an appreciably lower coefficient of expansion than that of said first layer glass;

covering said second layer of glass with a third layer of a removable protective glass;

fusing with the application of heat said first, second and third layers of glass interfacially to one another at one stage of the formation of the combination thereof, said heat placing said first layer of glass in tension and said second layer glass of lower coefficient of expansion in compression, the fused combination comprising a preform of said lens;

flattening said preform to a degree of precision producing a finish of ophthalmic quality upon said second layer of glass adjacent said third layer;

shaping at least a portion of said preform to at least approximately the shape desired of said lens; and

removing said third layer of protective glass from said shaped portion of said preform to expose the underlying surface of said second layer of glass, said underlying surface thus constituting a finished surface of said lens with said second layer of glass being in compression and said first layer of glass under tension whereby said resulting lens is rendered highly resistant to damage by impact.

3,899,316
BENDING OF GLASS SHEETS

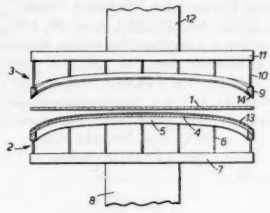
Robert Ehlers, Redditch, England, assignor to Triplex Safety Glass Company Limited, London, England

Filed Mar. 12, 1974, Ser. No. 450,375

Claims priority, application United Kingdom, July 20, 1973, 34708/73

Int. Cl.² C03B *23/02*

U.S. Cl. 65—106 **12 Claims**



1. A method of bending a glass sheet, comprising heating the sheet to a bending temperature and engaging opposite faces of the sheet with complementary bending surfaces at least one of which is a surface of resilient layer of alumino-silicate fibre mat material of non-oriented fibres disposed in random directions throughout the thickness of the layer and a binder which binds the fibres together, which mat material has the fibres so arranged that the volume of the mat includes from 85 percent to 95 percent free air space between the fibres.

3. A bending die for use in die bending a hot glass sheet, comprising a metal die shaped to the desired configuration of the sheet and on said die a resilient facing layer of alumino-silicate fibre mat material of non-oriented fibres disposed in random directions throughout the thickness of the layer and a binder which binds the fibres together, which mat material has the fibres so arranged that the volume of the mat includes from 85 percent to 95 percent free air space between the fibres.

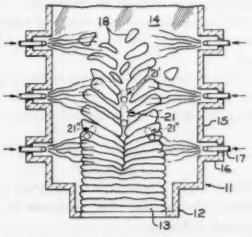
3,899,317
GLASS BATCH LOG CONTROL DEVICE AND METHOD FOR USING

Robert B. Heithoff, Cumberland, Md., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 23, 1973, Ser. No. 381,467

Int. Cl. C03b *5/20*

U.S. Cl. 65—135 **8 Claims**



1. In an apparatus for the manufacture of glass comprising a glass melting furnace having a bottom, side walls, a front wall, a back wall and a roof; further having, in the vicinity of said back wall, means for charging glass batch materials into said furnace; further having, in the vicinity of said front wall, means for discharging molten glass from said furnace; and further having means for supplying heat to at least a portion of said furnace for melting glass batch materials forming molten glass therefrom; wherein a portion of said furnace is for moving glass batch materials floating on molten glass in a general direction away from said back wall and toward said front wall while melting said floating glass batch materials; the improvement comprising

an elongated anchoring element extending downwardly in said furnace at a location spaced from said back wall yet where floating batch materials are encountered, said anchoring element having a downwardly extending portion and, at its lower extreme, an outwardly extending portion adapted for contacting the upper portion of floating batch materials and imposing a drag upon the floating batch materials for controlling the movement of the floating batch materials in said furnace, said elongated anchoring element being sufficiently thin so as not to dam said floating batch materials.

3,899,318
HERBICIDAL 1,5-DITHIA-2,4,6,8-TETRAZACYCLOOCTANE-3,7-DIONE

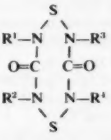
Philip S. Magee, Ignacio, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 341,005, March 14, 1973, Pat. No. 3,853,853. This application Sept. 30, 1974, Ser. No. 510,272

Int. Cl.² A01n *9/14*

U.S. Cl. 71—90 **12 Claims**

1. An herbicidal composition comprising an herbicidally effective amount of a compound of the formula



wherein R^1, R^2, R^3 and R^4 individually are hydrogen, lower alkyl of 1 to 6 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, phenyl, naphthyl, alkaryl of 7 to 10 carbon atoms or aralkyl of 7 to 10 carbon atoms, each of said phenyl, naphthyl, alkaryl or aralkyl groups being unsubstituted or substituted with from 1 to 4 substituents selected from the group consisting of fluorine, chlorine, bromine, trichloromethyl, trifluoromethyl, alkoxy of 1 to 4 carbon atoms or nitro, and a biologically inert carrier.

3,899,319
POWDER MIXTURE FOR THE PRODUCTION OF ALLOY STEEL WITH A LOW CONTENT OF OXIDE INCLUSIONS

Per Folke Lindskog, Hoganas; Per Gunnar Arbstedt, and Erik Goran Wastenson, both of Viken, all of Sweden, assignors to Hoganas AB, Fack, Hoganas, Sweden

Filed Oct. 29, 1974, Ser. No. 518,474

Int. Cl.² B22F *9/00*

U.S. Cl. 75—.5 BA **8 Claims**

1. A powder mixture for manufacturing of alloy steel articles having small and few oxide inclusions, comprising a metal powder portion which consists of a mixture of two powders, viz. an atomized prealloyed steel powder and a finely comminuted powder containing alloying elements, wherein alloying elements, the oxides of which have a free energy of formation with an absolute value less than 120 kcal/mole O_2 (502 kJ/mole O_2) at 1000° C substantially are contained in the atomized prealloyed powder while all alloying elements, the oxides of which have a free energy of formation with an absolute value exceeding 120 kcal/mole O_2 (502 kJ/mole O_2) at 1000° C, are completely contained in the finely comminuted powder.

3,899,320

PROCESS FOR MAKING IRON SPONGE PELLETS CONTAINING SILICON CARBIDE

Theodor Benecke, Grefrath; Günter Wiebke, Munich, and Carl Pfannenschmidt, Waltenhofen, all of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munich, Germany

Filed Feb. 25, 1974, Ser. No. 445,413

Claims priority, application Germany, Feb. 23, 1973, 2308888

Int. Cl.[2] C21B *13/00*

U.S. Cl. 75—33 **5 Claims**

1. A process for making iron sponge from iron ores containing at least 95% by weight of iron oxide comprising, pulverizing the iron ore to extremely fine grain size, mixing the pulverized iron ore with fine-grained silicon carbide, pelletizing the so obtained mixture, and subjecting the same to direct reduction.

3,899,321

METHOD OF PRODUCING A VACCUM TREATED EFFERVESCING BORON STEEL

Evan M. Oliver, Bethlehem, and Joseph V. Marsilio, Allentown, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed May 28, 1974, Ser. No. 473,975

Int. Cl. C21c *7/10;* **C22c** *39/00*

U.S. Cl. 75—49 **9 Claims**

1. Method of producing a low carbon, boron sheet steel comprising:

a. providing a steel melt having low residual alloy content containing by weight no more than 0.01 percent tin, 0.04 percent chromium, 0.01 percent molybdenum and 0.10 percent copper, and 0.03 to 0.08 percent carbon,

b. treating the steel melt with a vacuum to essentially complete the chemical reaction C + O CO by reducing the carbon to about 0.005percent by weight to leave an excess of oxygen in an amount greater than will provide a O:C ratio of at least 1.4:1,

c. adding boron to the vacuum treated melt in an amount sufficient to retain 0.006 to 0.020 percent by weight boron,

d. adding sufficient carbon to react with the residual oxygen in the melt so as to provide an effervescing steel melt containing 0.005 to 0.04 percent by weight carbon,

e. solidifying the effervescing steel melt, and

f. hot and cold rolling the solidified steel to form sheet.

3,899,322

NOBLE-TYPE METAL RECOVERY PROCESS BY USE OF MOLTEN SALT BATH

Samuel J. Yosim, Woodland Hills, and LeRoy F. Grantham, Calabasas, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 264,681, June 20, 1972, abandoned. This application May 16, 1973, Ser. No. 361,380

Int. Cl.[2] C22B *9/10, 11/00;* **C23G** *1/34*

U.S. Cl. 75—65 R **10 Claims**

1. A process for the separation and recovery of a noble-type metal selected from the group consisting of copper, silver, gold, palladium, platinum, and aluminum from scrap containing such metal values, said scrap including at least some organic combustible material, said process being performed under conditions resulting in substantially reduced emission of environmental pollutants, comprising:

feeding said noble type-metal-value-containing scrap and a source of uncombined gaseous oxygen into a pool of a molten salt consisting essentially of sodium carbonate containing about 1 to 25 wt.% sodium sulfate at a temperature between 800° and 1,800°C and above the melting point of said noble-type metal to thermally decompose the scrap to form separable scrap decomposition products and said metal, and

separately recovering said metal in molten form free from said scrap decomposition products, the process being so controlled so that the final gaseous effluent vented to the atmosphere consists essentially only of gases selected from carbon dioxide, water vapor, oxygen, and nitrogen.

3,899,323

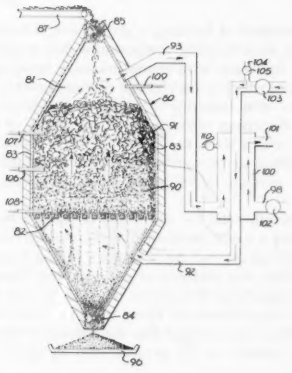
SILVER RECOVERY PROCESS

William Jan Van Slyke, Richland, Wash., assignor to Battelle Development Corporation, Richland, Wash.

Division of Ser. No. 264,262, June 19, 1972, Pat. No. 3,820,982, which is a continuation of Ser. Nos. 17,507, March 9, 1970, abandoned, Ser. No. 137,219, April 26, 1971, abandoned, and Ser. No. 194,453, Nov. 1, 1971, abandoned, said Ser. No. 194,453, is a continuation-in-part of Ser. No. 17,507, March 9, 1970, abandoned. This application Oct. 29, 1973, Ser. No. 410,920

Int. Cl.[2] C22B *11/02*

U.S. Cl. 75—83 **11 Claims**



1. A process for recovering silver from silver-bearing photographic film containing silver salts comprising the steps of:

a. subjecting the photographic film to hot nonoxidizing gases to prolyze the photographic film to form a silver-bearing carbon residue and a pyrolytic off-gas mixture said hot nonoxidizing gases being a gaseous mixture containing sufficient hydrogen to reduce silver salts to metallic silver;

b. burning the silver-bearing carbon residue in an oxidizing atmmosphere of a heated air and water vapor mixture of a sufficient temperature and ratio to burn the residue to form a silver-bearing ash and produce said hot nonoxidizing gases;

c. directing said nonoxidizing gases to the photographic film to perform step (a); and

d. separating the silver from the ash to recover the silver.

3,899,324

FLUX FOR CONTINUOUS CASTING OF STEEL

Paul M. Corbett, Baltimore, Md., assignor to SCM Corporation, Cleveland, Ohio

Filed Mar. 16, 1973, Ser. No. 342,052

Int. Cl.[2] C22B *9/10;* **C03C** *3/04;* **B22D** *11/04*

U.S. Cl. 75—94 **3 Claims**

1. In a process for the continuous casting of steel using an open-ended mold for the molten metal, the improvement which comprises covering the exposed surface of said molten metal with a layer of flux composition in the form of frit particles, said composition consisting of:

Ingredient	Percent by Weight
Na_2O	6–25
K_2O	0–10
Li_2O	0–8
SiO_2	5–40
P_2O_5	0–40
Al_2O_3	0–20
B_2O_3	0–10
F	2–15
MgO	0–20
CaO	5–30
BaO	0–20
SrO	0–20
Oxide of Period IV metal having Atomic Number of 23–28, inclusive	1–10
TiO_2	0–6
ZrO_2	0–5.

wherein said percentages are selected to total 100%.

3,899,325

METHOD OF MAKING A CLOSED END TUBE

Brian G. Harrison, Drexel Hills, Pa., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 14, 1969, Ser. No. 841,260

Int. Cl. B22f *1/00, 3/00, 3/20*

U.S. Cl. 75—208 R **2 Claims**

1. A process for making a metallurgically integral closed-end tube having a straight-walled tube portion and a terminal inner plug portion, said portions consisting essentially of sintered shaped powdered metal and characterized by having homogeneous metal grain size which comprises:

a. mixing powdered metal with a heat fugitive binder to form a clay-like mass;

b. shaping said clay-like mass into a green structure of said tube with said closed end; and

c. sintering said green structure in a reducing atmosphere to form said tube.

3,899,326

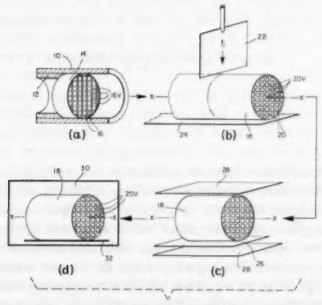
METHOD OF MAKING MONOLITHIC HONEYCOMBED STRUCTURES

Rodney I. Frost, and Louis M. Holleran, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 30, 1973, Ser. No. 346,606

Int. Cl.[2] B22F *3/12;* **B28B** *21/52*

U.S. Cl. 75—214 **7 Claims**



1. A method of making a monolithic honeycombed structure having a matrix of walls forming a multiplicity of open-ended cells extending from one end of the structure to the other by extruding a plastically deformable and sinterable batch through an extrusion die to form a honeycombed structure and firing the extruded structure to effect sintering, the improvement comprising:

positioning the extrusion axis of the structure during firing so as to extend in a substantially horizontal direction; and orienting the cell walls during firing such that series of connected cell walls extending from one side of the structure to the other extend in a generally vertical direction with a minimum horizontal projection of said series.

3,899,327

CHARGE CARRIER FOIL

Karl Esser, Stein; Robert Friedrich, Nuremburg, and John E. Segain, Gunzenhausen, all of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 1, 1974, Ser. No. 438,832

Claims priority, application Germany, Feb. 8, 1973, 2306158; Feb. 8, 1973, 2306159

Int. Cl. G03g *5/00;* **B44d** *1/16*

U.S. Cl. 96—1.5 **6 Claims**

1. A charge carrier foil comprising:

a flexible conducting metal foil;

a conducting intermediate layer on said metal foil, said intermediate layer comprising polyvinyl acetal containing lampblack as an additive; and

a non-conducting selenium layer arranged on said intermediate layer.

3,899,328

ACTIVE MATRIX AND INTRINSIC PHOTOCONDUCTIVE POLYMER OF A LINEAR POLYSILOXANE

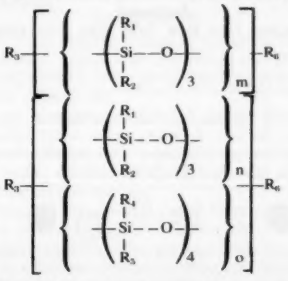
William W. Limburg, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 7, 1973, Ser. No. 357,987

Int. Cl. G03g *5/06*

U.S. Cl. 96—1.5 **12 Claims**

1. A photoconductive member comprising a substrate and at least one organic photoconductive layer comprising an intrinsic polymeric photoconductive material of the formulae



wherein R_1 is defined as a lower alkyl group;

R_2 is defined as an aromatic polycyclic group with fused aromatic rings having at least three fused ring nuclei or a heteroaromatic group;

R_3 is defined as a hydroxyl, or other polymeric end group; R_4 and R_5 are individually defined as a lower alkyl group; R_6 is defined as a polymeric end group; and m, n and o are positive numbers commensurate with a molecular weight of at least 1,000, the respective numerical products represented by $3n$ and $4o$ having a ratio of about 3:1 to 1:8.

3,899,329

MIXTURE OF PHOTOCONDUCTORS IN AN ACTIVE MATRIX

Lloyd F. Bean, Rochester, and Robert W. Gundlach, Victor, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 94,195, Dec. 1, 1970, abandoned. This application Apr. 12, 1973, Ser. No. 350,666

Int. Cl. G03q *5/06*

U.S. Cl. 96—1.5 **6 Claims**

1. A photoconductive layer comprising an unoriented mixture of finely divided photoconductive particles comprising

from about one-half to about 5 parts by weight cadmium sulfoselenide and from about 1 to about 5 parts by weight selenium dispersed in 100 parts by weight of an active binder matrix material, said photoconductive layer having a thickness of about 2 to 100 microns, with the photoconductive particles being present in a total combined concentration of about 0.5 to 5 percent by volume of the photoconductive layer, the mixture being capable of generating holes in response to imagewise radiation, the binder being capable of transporting holes injected from the photoconductive particles during imagewise exposure, with the binder material being selected from the group consisting of;

polyvinyl carbazole; poly-1-vinylpyrene; polymethylene pyrene; an N-substituted polymeric acrylic acid amide of pyrene; carbazole; N-ethylcarbzole; N-phenylcarbazole; pyrene; tetraphene; 1-acetylpyrene; 2,3-benzochrysene; 6,7-benzopyrene; 1-bromopyrene; 1-ethylpyrene; 1-methylpyrene; perylene; 2-phenylindole; tetracene; picene; 1,3,6,8-tetraphenylpyrene; chrysene; fluorene; fluorenone; phenanthrene; triphenylene; 1,2,5,6-dibezanthracene; 1,2,3,4-dibenzanthracene; 2,3-benzopyrene; 2,3-benzochrysene; anthraquinone; dibenzothiophene; naphthalene; and mixtures thereof, with said photoconductive layer exhibiting an absorption coefficient of at least 1/L and not more than 8/L where L is the photoconductor layer thickness in microns.

3,899,330

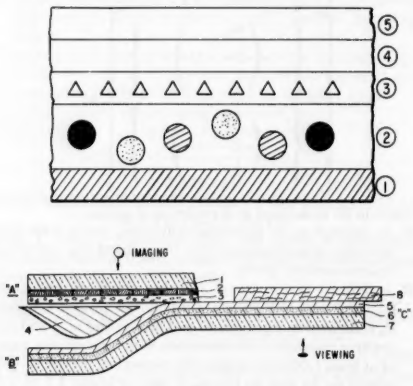
COLOR SCREENS FOR DIFFUSION TRANSFER PROCESSES CONTAINING COLOR FORMERS

Burton Harvey Waxman; Robert Thomas Shannahan, both of Endicott, and Felix Viro, Appalachin, all of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Mar. 2, 1973, Ser. No. 320,644The portion of the term of this patent subsequent to Apr. 17, 1990, has been disclaimed.

Int. Cl. G03c *7/00, 5/54, 7/04, 1/40, 1/84;* **G03f** *5/00*

U.S. Cl. 96—3 **8 Claims**



1. A two dimensional dual nature screen of from one to three colors, comprising an array of red, green or blue colored oil droplets, each droplet containing a non-diffusing filter dye having one of the primary colors in addition to a low molecular weight colorless color former fast to diffusion in aqueous gelatin matrices having a pH normal to photographic coating operations of from 6.0 to 7.0 but diffusible through such aqueous gelatin matrices at a pH higher than 7.0, and capable of forming upon coupling with the oxidation products of a paraphenylenediamine color developer a non-diffusing dye complementary in color to the filter dye of the oil droplet in which said color former was contained.

5. A method of forming a multicolor reproduction of an original image or object using the dual nature screen carried by a panchromatic emulsion, according to claim **3**, comprising:

exposing the panchromatic emulsion through said dual nature screen;

developing said exposed panchromatic emulsion with a fast acting color developer of alkaline pH while said exposed panchromatic emulsion is in contact with a receiving element, said colorless colorformer being diffusible at the pH of said color developer;

allowing sufficient time for maximum color former to transfer through unexposed areas of the panchromatic emulsion and for the fast acting developer to penetrate and fill the screen, panchromatic emulsion and receiving element to actuate the diffusion of the color formers, as modulated by the exposed panchromatic emulsion, from the dual nature screen to the receiving element;

and forming indoaniline or azomethine dyes in the receiving layer from the color former transferred to the receiving layer by coupling said color former with residual color developer or a p-phenylene derivative in the presence of an oxidizing agent.

3,899,331

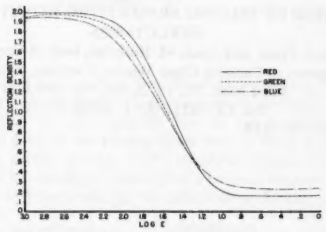
MULTICOLOR DYE DEVELOPER DIFFUSION TRANSFER PROCESSES WITH PYRAZOLO-[3,4D] PYRIMIDINES

Stanley M. Bloom, Waban, and Nicholas S. Hadzekyriakides, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

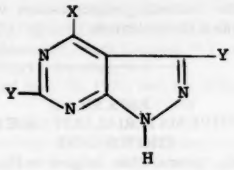
Filed Nov. 14, 1973, Ser. No. 415,783

Int. Cl. G03c *7/00, 5/30, 1/40, 1/06, 1/48, 1/34*

U.S. Cl. 96—3 **19 Claims**



1. A diffusion transfer color process comprising exposing a photosensitive element comprising a blue-sensitive silver halide emulsion having a yellow dye developer associated therewith, a green-sensitive silver halide emulsion having a magenta dye developer associated therewith, and a red-sensitive silver halide emulsion having a cyan dye developer associated therewith, applying an aqueous alkaline processing composition to said exposed photosensitive element to effect development and to form an imagewise distribution of unoxidized dye developer in undeveloped areas of each of said silver halide emulsions as a function of said development, said process including the step of transferring by diffusion at least a portion of said imagewise distributions of unoxidized dye developer to an image-receiving layer in superposed relationship therewith to thereby provide a multicolor diffusion transfer image, said development being effected in the presence of a pyrazolo-[3,4d]pyrimidine of the formula



wherein each Y is hydrogen or a 1 to 5 carbon alkyl group and X is hydrogen, $-NH_2$ or —NH—R, R being a 1 to 5 carbon alkyl group or an aralkyl group of 7 to 10 carbons.

3,899,332

PRINTING PLATE AND METHOD OF MAKING THE SAME

Richard T. Traskos, Brooklyn, Conn., assignor to Lith-Kem Corporation, Lynbrook, N.Y.

Division of Ser. No. 288,043, Sept. 11, 1972, Pat. No. 3,837,858. This application June 12, 1974, Ser. No. 478,639

Int. Cl.[2] G03F *7/02*; **G03C** *1/52*

U.S. Cl. 96—33 **37 Claims**

1. A method of treating a planographic printing plate having a hydrophilic substrate and a first coating containing a water soluble light reactive diazo resin on said substrate, including the step of:

applying a second coating containing a photosensitive solvent-soluble diazo-borofluoride salt over and in intimate contact with said first coating;

said plate being developable by water or aqueous solution whereby areas of the first and second coatings unexposed to light are washed away to define hydrophilic oleophobic nonprinting areas, and areas of the first and second coatings exposed to light define hydrophobic oleophilic printing areas.

3,899,333

PHOTOSENSITIVE COMPOSITION CONTAINING TiO_2 HAVING A PARTICLE SIZE OF ABOUT 25 MILLIMICRONS AND THE USE THEREOF IN PHYSICAL DEVELOPMENT

Elliot Berman, Braintree, and Carl F. W. Ekman, Bedford, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Continuation of Ser. No. 432,887, Feb. 15, 1965, abandoned, and a continuation-in-part of Ser. No. 360,094, April 15, 1964, abandoned. This application Feb. 27, 1973, Ser. No. 336,389

Int. Cl. G03c *5/24*, *1/00*

U.S. Cl. 96—48 PD **13 Claims**

1. In a data storage medium comprising a substrate and a radiation sensitive coating thereon, said coating consisting essentially of particulate titanium dioxide dispersed in a binder, said medium being suitable for use in a process wherein said medium is exposed imagewise and contacted with a physical developer comprising a solution of metal ions and a reducing agent for said metal ions to produce a visible image in said medium, the improvement wherein said particulate titanium dioxide has an average particle size of about 25 millimicrons.

12. In a process of recording an image pattern of actinic light by exposing to an image pattern of actinic light a data storage medium comprising a particulate titanium dioxide in an organic binder which titanium dioxide becomes reversibly activated by such exposure and thereby capable of causing chemical reactions at portions of said medium corresponding to said image pattern of actinic light and then applying to at least reversibly activated portions of said medium a physcial developer comprising a solution of metal ions and a reducing agent for said metal ions which forms metal images solely on contact with at least activated portions of said data storage medium, the improvement wherein the titanium dioxide has an average particle size of about 25 millimicrons.

3,899,334

PHOTOIMAGING PROCEDURES AND COMPOSITIONS

Floyd B. Erickson, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 190,337, Oct. 18, 1971, Pat. No. 3,801,320. This application Oct. 11, 1973, Ser. No. 405,345

Int. Cl. G03c *5/24*

U.S. Cl. 96—48 R **11 Claims**

1. The method of treating an image comprised of hydroperoxy groups attached to a polymeric substate comprising a polymer with a hydrocarbon backbone which comprises contacting same with sulfur dioxide.

3,899,335

DIAZOTYPE ELEMENTS AND PROCESSES WITH CARBODIIMIDE DEHYDRATING AGENTS TO GENERATOR COUPLERS

Wojciech Maria Przezdziecki, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 20, 1974, Ser. No. 452,895

Int. Cl.[2] G03C *1/58*, *1/60*, *5/34*

U.S. Cl. 96—49 **8 Claims**

1. A method of forming an azo dye image comprising the step of:

1. imagewise exposing to actinic radiation a supported layer comprising
   a. a light-sensitive diazonium compound; and
   b. at least one compound selected from at least one but not both of
      i. a solid carbodiimide dehydrating agent having the formula

$$R^1N{=}C{=}N{-}R^2$$

wherein R^1 is an organic radical of the group consisting of alkyl, cycloalkyl, aralkyl, and aryl groups and amino derivatives thereof, and R^2 is of the group consisting of hydrogen and said organic radicals, and

      ii. an N-organic substituted glycine convertible by dehydration, when placed in reactive contact with carbodiimide, into a heterocyclic active methylene coupler reactive with said diazonium compound to form an azo dye; and
2. heating said imagewise exposed layer while in contact with a layer comprising the other of (i) and (ii) to a temperature sufficient to cause said acid and said carbodiimide dehydrating agent to come into reactive contact thereby initiating formation of said coupler by dehydration and production of said azo dye image by reaction of said coupler with unexposed portions of said diazonium compound.

4. A light-sensitive heat-developable diazotype imaging element comprising,

a. a layer comprised of a normally solid carbodiimide dehydrating agent having the formula

$$R^1{-}N{=}C{=}N{-}R^2$$

wherein R^1 is an organic radical of the group consisting of alkyl, cycloalkyl, aralkyl and aryl groups and amino derivatives thereof, and R^2 is of the group consisting of hydrogen and said organic radicals, and

b. a layer comprised of a an N-organic substituted glycine convertible by dehydration, when in reactive contact with said carbodiimide, into a coupler having a heterocyclic ring containing both a nitrogen atom and a couplingreactive methylene radical, capable of coupling with a diazonium compound, wherein (a) and (a′) are separate layers,

one of said layers (a) and (b) further including a light-sensitive diazonium compound.

7. A light-sensitive heat-developable diazotype composition for use with a coupler precursor capable of forming a coupler

upon dehydration; the composition comprising, an admixture of

a light-sensitive diazonium compound, and

a normally solid carbodiimide dehydrating agent having the formula

$$R^1—N=C=N—R^2$$

wherein R^1 is an organic radical of the group consisting of alkyl, cycloalkyl, aralkyl and aryl groups and amino derivatives thereof, and R^2 is of the group consisting of hydrogen and said organic radicals.

3,899,336

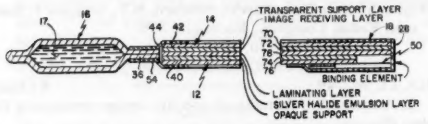
PROCESSING COMPOSITION FOR DIFFUSION TRANSFER COLOR PROCESS CONTAINING POLYETHYLENE GLYCOL

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 247,023, April 24, 1972, Pat. No. 3,793,023. This application Nov. 29, 1973, Ser. No. 420,098

Int. Cl. G03c *5/30, 1/48*

U.S. Cl. 96—66 R **8 Claims**



1. A rupturable container releasably holding a processing composition adapted for use in forming diffusion transfer dye developer images, said processing composition comprising an aqueous alkaline solution of a film-forming, viscosity-providing polymer having a light-reflecting pigment dispersed therein, said composition further including a water-soluble polyethylene glycol.

3,899,337

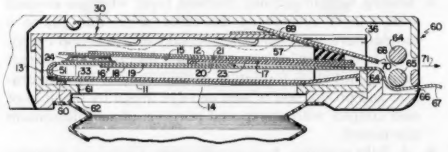
MULTILAYER FILM PACK WITH SCRATCH REDUCING MEANS

John W. Nestor, Jr., Carlisle, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 28, 1973, Ser. No. 429,042

Int. Cl. G03c *1/48*

U.S. Cl. 96—76 C **6 Claims**



1. A photographic film package comprising:

a generally flat, elongated container having an exposure opening in one flat wall and an exit opening at one transverse end;

a film unit including a photosensitive sheet element, a non-photosensitive sheet element and a rupturable container retaining a fluid processing composition, said photosensitive sheet element being cooperatively associated with said exposure opening and adapted to be exposed to light transmitted through said exposure opening;

web means interconnecting said sheet elements including means by which said photosensitive sheet can be moved into contacting superposition with said non-photosensitive sheet element; and

scratch reducing means mounted on said flat wall having said exposure opening and contacting said photosensitive sheet element, said scratch reducing means adapted to contact substantially the entire surface of said photosensitive sheet element as said photosensitive sheet element is moved into contacting superposition with said non-photosensitive sheet element.

3,899,338

PHOTOSENSITIVE MATERIAL SUITABLE FOR USE AS A PHOTORESIST

James M. Lewis, Aurora, Ohio, assignor to Horizons Incorporated, Cleveland, Ohio

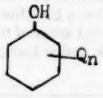
Continuation-in-part of Ser. No. 224,939, Feb. 9, 1972, abandoned. This application July 15, 1974, Ser. No. 488,857

Int. Cl.² G03C *1/68, 1/70*

U.S. Cl. 96—115 P **14 Claims**

1. A photosensitive material suitable for use as a photoresist and consisting essentially of the following materials dissolved in a resin binder exhibiting a good degree of solubility in an alkanol selected from the group consisting of methanol, ethanol and propanols, and at least 2% solubility in an azeotrope of said alcohols and water;

1. at least one polymerizable N-vinyl monomer;
2. at least one activator for enhancing the effect of exposing said monomer to a suitable dose of electromagnetic radiation at least sufficiently to initiate polymerization of said monomer, said activator being selected from the group consisting of: organic halogen compounds in which at least three halogen atoms selected from the group consisting of Cl, Br and I are attached to a single carbon atom, sulfonyl chlorides, sulfonyl bromides, sulfenyl chlorides, sulfenyl bromides and mercapto compounds wherein the mercapto group is attached to a carbon atom in a heterocyclic nucleus; and
3. a substituted phenol represented by the general formula:



in which Q represents one or more hydroxyl groups, amino groups, alkyl or allyl groups and not all of the Q's need be the same, and *n* is an integer from 1 to 5;

and in which the proportions of the several constituents are as follows, in parts by weight:

polymerizable N-vinyl monomer	15 to 150
activator	1 to 300
substituted phenol	1 to 100
resin binder	250 to 3000

the weight of binder being greater than the total weight of polymerizable monomer, activator and phenol and the resin binder being a polymer or copolymer of a polyvinyl compound selected from the group consisting of polyvinyl esters, ketones, acetals, alcohols and keto-esters soluble in said alcohols or in their azeotropes with water.

3,899,339

WATER SOLUBLE SOLDER RESIST

Henry G. Peters, Jr., Owego, and Philipp W. H. Schuessler, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 12, 1972, Ser. No. 297,118

Int. Cl. C09d *5/20;* **B44d** *1/52*

U.S. Cl. 106—2 **1 Claim**

1. A masking composition to prevent deposition of molten solder consisting of by weight; 10 to 70% sodium silicate solution at 40° Baume, 5 to 10% of glycerol or glycol, 0.03 to 0.3% of a corrosion inhibitor which is a quarternary amine iodide, 0.1 to 0.6% of a xanthene tinting agent or non-reactive vegetable dye, and the remainder being water.

3,899,340

HIGH ELASTIC MODULUS GLASS-CERAMIC ARTICLES

Joseph W. Malmendier, South Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,106
Int. Cl. C04b 35/04
U.S. Cl. 106—39.6 6 Claims

1. A glass-ceramic article demonstrating an elastic modulus greater than about 18×10^6 psi consisting essentially of crystals of aluminoborate and/or magnesium borate solid solutions homogenously dispersed in a glassy matrix, which crystals comprise at least 75% by volume of said article, the composition of said article being substantially the same throughout and consisting essentially, by weight on the oxide basis, of about 5–25% MgO, 10–45% Al_2O_3, and 20–45% B_2O_3.

3,899,341

REFRACTORY FIRED SHAPED ELEMENT AND PROCESS OF ITS MANUFACTURE

Hans Georg Schwarz, Marktredwitz, Germany, assignor to Didier-Werke AG, Germany

Filed Apr. 4, 1974, Ser. No. 458,022
Claims priority, application Germany, Apr. 30, 1973, 2321810
Int. Cl.² C04B 35/48
U.S. Cl. 106—57 6 Claims

1. A refractory fired shaped element for closures in casting units for metals, said element comprising 10 to 50 % by weight zirconium oxide and 50 to 90 % by weight zirconium silicate, 30 to 60 % by weight of the total amount of zirconium oxide being present in stabilized form and 70 to 40 % by weight of the total amount of zirconium oxide being present in unstabilized form.

3,899,342

COMPLEX PHOSPHATES

James Derek Birchall; John Edward Cassidy; Nicholas Rolfe, and Clifford Granville Miles, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 12, 1972, Ser. No. 296,985
Claims priority, application United Kingdom, Oct. 19, 1971, 48576/71; June 8, 1972, 26803/72
Int. Cl. C04b 35/02
U.S. Cl. 106—65 11 Claims

1. A method of binding refractory solids which comprises forming a slurry or paste containing the solids to be bound and an aqueous solution containing aluminium ions and orthophosphate ions in an Al:P ratio of substantially 1:1 and additionally the anions of a carboxylic acid or a mineral oxyacid in a ratio of additional anion: aluminium ions in the range of 0.5:1 to 4:1, the aqueous solution containing from 1 to 25% of solids by weight of the refractory solids to be bound, and curing the phosphate binder.

3,899,343

BRIGHTNESS OF CRYSTALLINE LAYERED SILICATE MINERALS

John C. Lim, Somerville, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Feb. 26, 1973, Ser. No. 335,471
Int. Cl. C09c 1/42; C08h 17/06
U.S. Cl. 106—72 3 Claims

1. A method for bleaching kaolin clay containing as an impurity a ferric compound which is not removed therefrom by a dithionite bleaching reagent which comprises forming a suspension of said clay with a dilute solution in dimethylsulfoxide of a complexing ligand selected from the group consisting of alkali metal thiocyanate, ammonium thiocyanate, acetylacetone, o-phenanthroline, bipyridine, ethylenediamine, mercaptoacetic acid, thiomalic acid, mercaptoethanol and mixtures thereof, said complexing agent being present in amount to react with said ferric compound in said clay to form a colored coordination complex and said dimethylsulfoxide being present in amount substantially in excess of 1 mole per equivalent of said clay and sufficient to maintain a liquid phase of dimethylsulfoxide after said reaction is completed, maintaining said suspension under conditions of time and temperature which favor formation of a kaolinite-dimethylsulfoxide intercalation compound until a colored coordination complex is formed by reaction between ferric ions in the impurity and said complexing ligand, separating the clay from a liquid phase, and washing the separated clay with water to decompose the kaolinitedimethylsulfoxide complex and restore the crystal structure to the clay.

3,899,344

FIBER REINFORCED CONCRETE PRODUCTS AND THEIR FORMATION

Gus R. Jakel, Los Angeles, Calif., assignor to California Cement Shake Co., Inc., Alhambra, Calif.

Continuation-in-part of Ser. No. 303,677, Nov. 6, 1972. This application July 16, 1973, Ser. No. 379,749
Int. Cl. C04b 7/02
U.S. Cl. 106—99 4 Claims

1. In the process of making a reinforced, relatively flexible concrete slab product, the steps that include

a. combining the following constituents in the stated relative amounts to form an aqueous admixture:
between 180 and 195 pounds of Portland cement
between 72 and 90 pounds of perlite
between 38 and 46 gallons of aqueous cellulose pulp and polyester fibers, and
between 7 and 9 gallons of slaked lime, and

b. forming the product from said admixture and curing the product,

c. said polyester fibers comprising between 0.05 and 0.15 percent, by weight, of the admixture and being straight.

3,899,345

LIME-FLY ASH-SULFITE COMPOSITIONS

Leonard John Minnick, Cheltenham; William C. Webster, Norristown, and Charles L. Smith, Conshohocken, all of Pa., assignors to IU Technology Corporation, Miami, Fla.

Continuation of Ser. Nos. 259,461, June 5, 1972, Pat. No. 3,785,840, and Ser. No. 412,273, Nov. 12, 1973. This application Dec. 26, 1973, Ser. No. 427,686The portion of the term of this patent subsequent to Jan. 15, 1991, has been disclaimed.
Int. Cl. C04b 7/34
U.S. Cl. 106—118 42 Claims

1. An ecologically acceptable method of producing a hardenable, structural cementitious composition, said method consisting of treating a slurry produced in a stack gas scrubber wherein sulfur oxide-containing stack gases are desulfurized by chemical treatment with materials including lime or limestone, the resultant scrubber slurry comprising an aqueous suspension of alkaline earth metal sulfites and alkaline earth metal oxides, hydroxides, sulfates or carbonates, said slurry treatment consisting of dewatering said slurry and adding to said dewatered slurry a pozzolanically active waste material and alkaline earth metal material as required, such that the final composition of the solids in said treated slurry comprises 0.25 to 70 weight % alkaline earth metal hydroxides, 0.25 to 70 weight % alkaline earth metal sulfite, and pozzolanically active waste material providing pozzolanic activity equal to 10 to 99.5 weight % fly ash determined by ASTM Test C-618, the resultant composition having a solids content of 30–90%, by weight.

3,899,346

OPACITY MODIFIED PIGMENTARY COMPOSITIONS

Thomas Howard Ferrigno, 29 Clover Hill Cir., Trenton, N.J. 08638

Continuation-in-part of Ser. No. 306,926, Nov. 15, 1972, Pat. No. 3,856,545. This application Apr. 30, 1973, Ser. No. 356,055

Int. Cl.[2] C09C *3/00*

U.S. Cl. 106—288 12 Claims

1. A pigmentary composition comprising calcined agglomerates consisting essentially of from about 70 to 98 parts by weight of anhydrous minerals having a refractive index of from about 1.47 to 1.74 and selected from the group consisting of silica, alkali metal silicates, alkali alumino silicates and mixtures thereof; from about 1 to 10 parts by weight of an inorganic binder selected from the group consisting of soluble silicates, sodium polyphosphates and expanding lattice montmorillonites; and an opacifying agent consisting of an inorganic colorant having a refractive index exceeding that of the mineral in the composition, said inorganic colorant being selected from the group consisting of white inorganic colorants and inorganic colorants having a color other than white and when said colorant is white it is present in an amount of from about 1 to 20 parts by weight and when said colorant has a color other than white it is present in an amount of from 0.001 to 10% by weight, said anhydrous minerals being in the form of particles having an average particle size of from about 2 to 40 microns which are bonded together in the form of agglomerates ranging in size from about 20 microns to 1 centimeter and having voids therein such that the specific gravity of the agglomerates is in the range of from about 60 to 95% of that of the inorganic material in the composition.

3,899,347

PRASEODYMIUM CONTAINING CERAMIC PIGMENTS

Heinz-Dieter de Ahna, Neuisenberg, and Rüdiger von der Gonna, Erlensee, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed July 17, 1974, Ser. No. 489,435

Claims priority, application Germany, July 27, 1973, 2338154

Int. Cl.[2] C09C *1/00*

U.S. Cl. 106—299 8 Claims

1. A zirconium dioxide-silicon dioxide-praseodymium oxide ceramic pigment containing 0.01 to 10% of an oxide of a metal of the group consisting of antimony, bismuth, niobium and tantalum.

3,899,348

METHOD FOR AUTOMATICALLY CLEANING REUSABLE FOODSTUFF CONTAINERS WITH REDUCED QUANTITIES OF FRESH WATER AND CHEMICALS

Erhard Tedden, D-423 Wesel 13, Am Moorbusch 1, Germany

Filed Oct. 19, 1972, Ser. No. 299,052

Int. Cl. B08b *3/04*, *7/04*, *9/08*

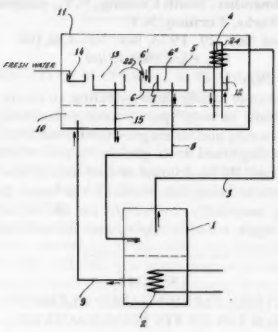
U.S. Cl. 134—12 6 Claims

1. A method for supplying and circulating liquid in an automatic cleaning machine for reusable foodstuff containers, said machine being of the type containing successive liquid cleaning and rinsing baths or stages for application of cleaning agent and rinse to the foodstuff containers travelling through the machine, said method comprising:

heating liquid in an evaporator to form steam;

passing the steam to a heat exchanger in the machine to liberate heat for heating washing liquid in the machine and to form condensate from said steam;

feeding the condensate to a first rinse water container in the machine; and



rinsing the foodstuff containers with the condensate in the first rinse water container.

3,899,349

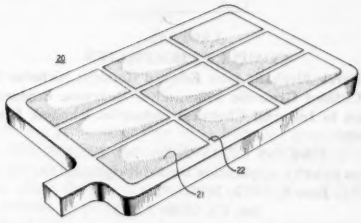
CARBON DIOXIDE CURING OF PLATES FOR LEAD-ACID BATTERIES

Charles Frederick Yarnell, Somerville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 6, 1974, Ser. No. 440,152

Int. Cl.[2] H01M *39/00*

U.S. Cl. 136—27 9 Claims



1. Process for the fabrication of lead-acid batteries containing positive electrodes, negative electrodes and electrolyte which includes the steps of pasting the positive and negative electrodes with a paste consisting essentially of tetrabasic lead sulfate, substantially drying the positive and negative electrodes before curing, curing the positive and negative electrodes and forming the positive and negative electrodes in aqueous sulfuric acid characterized in that at least one electrode is cured in a curing atmosphere which consists essentially of carbon dioxide and water vapor and the electrodes are maintained at a temperature below the temperature of the curing atmosphere but above the freezing point of water during at least part of the curing.

3,899,350

METHOD OF PREPARING HIGH CAPACITY NICKEL ELECTRODE POWDER

John F. Jackovitz, Monroeville, and Earl A. Pantier, Verona, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

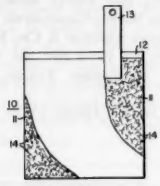
Filed Nov. 20, 1972, Ser. No. 308,087

Int. Cl. H01m *43/04*

U.S. Cl. 136—29 8 Claims

1. A method of producing active battery material for use in an electrode plate by (a) providing a starting material consisting essentially of $Ni(OH)_2$ (b) chemically oxidizing 5 to 25

percent of the starting material by chemically reacting it with halogen in a caustic hydroxide solution, wherein about 3.3–13.2 moles of halogen is reacted per 100 moles of Ni-



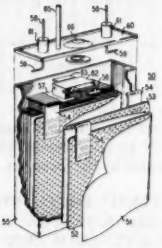
$(OH)_2$, forming an active material comprising between 75 to 95 weight percent $Ni(OH)_2$ and between 5 to 25 weight percent Ni(III) hydroxide.

3,899,351

FORMATION OF ELECTRODES FOR ALKALINE BATTERIES

Dean William Maurer, Berkeley Heights, and Leona Louise Schull, Fanwood, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 12, 1974, Ser. No. 478,505
Int. Cl. H01m *35/30*
U.S. Cl. 136—34 **11 Claims**



1. A process for the fabrication of alkaline cells in which at least one of the electrodes is made by a series of steps comprising impregnating a nickel plaque and forming the impregnated nickel plaque characterized in that forming is carried out in an aqueous electrolyte containing a base with a basicity constant greater than 0.1 with concentration between 4 Molar and the saturation concentration of the aqueous electrolyte with forming temperature between 40°C and the boiling temperature of the aqueous electrolyte and with a charge/discharge rate in amperes from 4 to 10 times the ampere-hour capacity of the electrode.

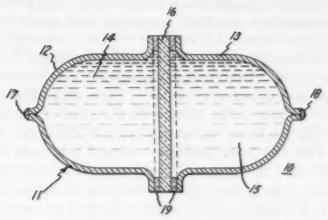
3,899,352

SEALED PRIMARY SODIUM-HALOGEN CELL

Gregory C. Farrington, Clifton Park; Fritz G. Will, Scotia, and Peter C. Lord, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 27, 1974, Ser. No. 455,150
Int. Cl. H01m *27/16*
U.S. Cl. 136—83 R **2 Claims**

1. A sealed primary sodium-halogen cell comprising a casing, an anode positioned in the casing, the anode selected from the class consisting of sodium, sodium as an amalgam, and sodium in a nonaqueous electrolyte, a solid sodium ion-conductive electrolyte positioned in the casing adjacent the anode, and a cathode positioned adjacent the opposite side of the electrolyte, the cathode comprising a mixture selected from the class consisting of from 1.0 to 90.0 weight percent of bromine and from 10.0 to 99.0 weight percent of a substance selected from the class consisting of phosphoryl chloride and phosphoryl bromide; from 1.0 to 90.0 weight percent of iodine and from 10.0 to 99.0 weight percent of a substance selected from the class consisting of phosphoryl chloride and phosphoryl bromide; from 1.0 to 89.0 weight percent of bromine,



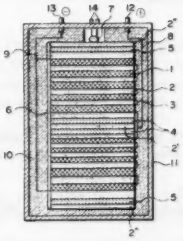
from 1.0 to 89.0 weight percent of iodine and from 10.0 to 98.0 weight percent of a substance selected from the class consisting of phosphoryl chloride and phosphoryl bromide; from 1.0 to 89.0 weight percent of bromine, from 1.0 to 20.0 weight percent of aluminum bromide and from 10.0 to 98.0 weight percent of a substance selected from the class consisting of phosphoryl chloride and phosphoryl bromide.

3,899,353

THERMAL BATTERY

Masao Tomita, Takatsuki, Japan, assignor to Yuasa Battery Company Limited, Takatsuki, Japan

Filed Apr. 2, 1974, Ser. No. 457,186
Int. Cl.² H01M *11/00*
U.S. Cl. 136—83 T **13 Claims**



1. A thermal battery, comprising:
a casing;
a plurality of electrical battery cells disposed in a column within said casing, each said cell including a positive plate, a negative plate and an electrolyte layer between said positive and negative plates;
a plurality of heat generating pellets for actuating said plurality of cells;
at least one heat reservoir;
each of said electrolyte layers comprising a eutectic mixture of potassium chloride and lithium chloride and an additive selected from the group consisting of barium nitrite and lithium chromate;
means for conveying electrical energy produced in said cells from said cells and through said casing; and
means for actuating said plurality of heat generating pellets.

3,899,354

GAS ELECTRODES AND A PROCESS FOR PRODUCING THEM

Karl V. Kordesch, Lakewood, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 10, 1973, Ser. No. 395,552
Int. Cl. H01m *27/04*
U.S. Cl. 136—86 D 12 Claims

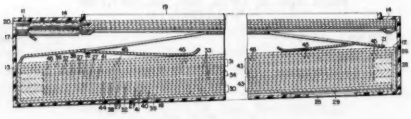
1. A thin catalyzed gas electrode comprising a porous wetproofed conductive substrate having a first water-repellent porous active conductive layer over which is a second layer of a noble metal catalyst in an amount at least about 0.5 mg/cm², said noble metal substantially disposed on the surface of the wetproofed porous active conductive layer with effectively no penetration of said noble metal into the smaller pores of the active conductive layer, said pores being in the order of about 50A; said thin electrode having an overall thickness between about 0.005 and about 0.025 inch; and said water-repellent porous active conductive layer containing an active material dispersed in a water-repellent agent such that the active material is present in an amount at least about 45% by weight of the water-repellent porous active conductive layer.

3,899,355

BATTERY ASSEMBLY

Charles K. Chiklis, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 14, 1974, Ser. No. 442,377
Int. Cl. H01m *21/00*
U.S. Cl. 136—111 20 Claims



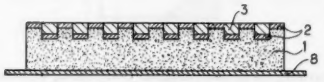
1. A planar battery which comprises, in combination and in superposed relationship, electrical energy generating components including:
a. a planar anode;
b. a planar cathode superposed substantially coextensive the anode;
c. a planar separator positioned intermediate and extending substantially coextensive the facing surfaces of the anode and the cathode including marginal portions and an aqueous electrolyte permeable central portion;
d. an aqueous electrolyte disposed in the central portion of the separator and in contact with the facing surfaces of the anode and the cathode; and
e. an electrically nonconducting, water vapor impervious heat-activated thermosetting adhesive extending coextensive the marginal surfaces of the separator and securing the separator to the contiguous facing surfaces of the anode and the cathode, said adhesive being the product of the reaction between a polymer containing active hydrogen atoms and a thermally dissociated adduct of a compound containing at least two –N=C=X groups wherein X is selected from the group consisting of oxygen and sulfur and the adduct is based on a compound selected from the group consisting of phenols, alkyl and aryl thiols and 1,3-dicarbonyl compounds.

3,899,356

POROUS ELECTRODE FOR A FUEL CELL AND METHOD OF MAKING SAME

Pierre Groult, Longjumeau; Francois Hubert, Paris; Jacques Daunay, Versailles, and Pierre Bono, Morangis, all of France, assignors to Societe Generale de Constructions Electriques et Mecaniques Alsthom & Cie, France

Filed Jan. 24, 1974, Ser. No. 436,330
Claims priority, application France, Jan. 24, 1973, 73.02454
Int. Cl. H01m *35/00*
U.S. Cl. 136—120 FC 23 Claims



1. A porous electrode for a fuel cell comprising:
a catalytic layer containing a mixture of a catalyst and of a polymer;
a stop layer arranged on one of the faces of the catalytic layer and consisting essentially of said polymer, the stop layer and the catalytic layer having an open porosity of from about 40 to about 60%; and
current collector means made of an electronically conductive and chemically inert material;
said electrode being characterized in that the current collector means crosses through portions of the whole of the stop layer and penetrates into portions of the catalytic layer.

3,899,357

ELECTRODES INCLUDING MIXED TRANSITION METAL OXIDES

Rose V. Rinaldi, West Long Branch, and James E. Wynn, Neptune, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 114,711, Feb. 11, 1971, abandoned. This application July 16, 1973, Ser. No. 379,885
Int. Cl.² H01M *13/02*
U.S. Cl. 136—121 1 Claim

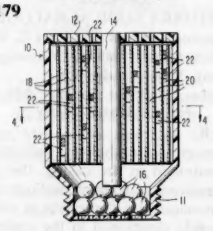
1. A battery electrode comprising an expanded nickel mesh coated with a mixture of 20 to 35 percent by weight of a mixed transition metal oxide selected from the group consisting of $MgCoAl_4O_8$, $CuFeAl_4O_8$, $CuCoAl_4O_8$, $MgCuAl_4O_8$, $CoFeAl_4O_8$ and $MgFeAl_4O_8$ with conductive carbon and polytetrafluoro ethylene.

3,899,358

FILTER CAP FOR STORAGE BATTERIES

Erik G. Sundberg, Stockholm, Sweden, assignor to Aktiebolaget Tudor, Stockholm, Sweden

Filed Apr. 12, 1973, Ser. No. 350,654
Int. Cl. H01m *1/06*
U.S. Cl. 136—179 9 Claims



1. In combination with a storage battery in which gas is liberated during its normal use and having openings in the

cover thereof, a filter cap for a cover opening, said filter cap comprising a housing with a lower end adapted to fit with a gas tight seal in the cover opening and an upper wall with vent openings, a plurality of substantially vertical walls of a microporous material in the space between the lower end and the upper wall, the space between said adjacent vertical walls forming passageways for the gas liberated from the battery, and slanted barrier means in said passageways comprising a plurality of members which extend across the sheet material at an angle relative to the vertical direction and which have a height such that when the spiral is wound, the members extend across the entire passageways.

3,899,359

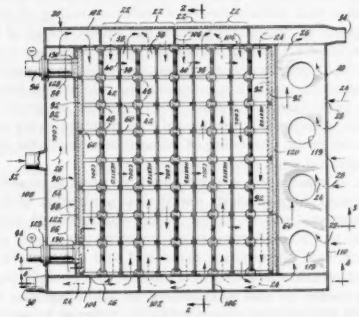
THERMOELECTRIC GENERATOR

John Z. O. Stachurski, 1684 W. 10th St., Brooklyn, N.Y. 11223

Continuation-in-part of Ser. No. 53,168, July 8, 1970, abandoned. This application Apr. 12, 1973, Ser. No. 350,407

Int. Cl.[2] H01L *35/32*

U.S. Cl. 136—205 **27 Claims**



1. An efficient method for directly converting heat to electricity from thermoelectric elements arranged in electrical connection to produce electrical power comprising the steps of

passing heated and cool fluid streams in overall counterflow direct heat exchange relationship with each other to generate a temperature difference between passes of the direct heat exchanging fluid streams, with said cool fluid stream capturing a substantial portion of the heat energy in the heated fluid stream by heat transfer to the cool fluid stream,

exposing opposite sides of said thermoelectric elements in high heat conductive relationship to respective passes of said direct heat exchanging streams to subject the elements to a temperature difference for the efficient production of electrical power from the electrically connected thermoelectric elements.

3,899,360

STABILIZED P-TYPE LEAD TELLURIDE

James H. Bredt, Garrett Park, Md., and Louis F. Kendall, Jr., Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 756,395, Aug. 30, 1968, abandoned. This application Mar. 1, 1971, Ser. No. 119,821

Int. Cl. H01v *1/18*

U.S. Cl. 136—238 **2 Claims**

1. A thermoelectric generator component for operation at a selected temperature above 400°C comprising a semiconducting thermoelement and a metal electrode in intimate electrical contact with the thermoelement, said electrode being of a metal selected from the group consisting of iron and iron-base alloys, and said thermoelement consisting essentially of a solid solution of a relatively small amount of manganese telluride in p-type lead telluride which solid solution is saturated at the selected operating temperature above 400°C.

3,899,361

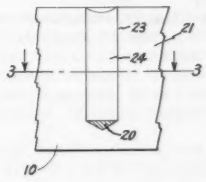
STABILIZED DROPLET METHOD OF MAKI[illegible] DEEP DIODES HAVING UNIFORM ELECTRICAL PROPERTIES

Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 30, 1973, Ser. No. 411,008

Int. Cl. H01l *7/34*

U.S. Cl. 148—1.5 **10 Claims**



1. The thermal gradient zone melting method of making a semiconductor device which comprises the steps of providing a matrix body of semiconductive material of first-type semiconductivity, providing within the matrix body a liquid body of metal-rich solution of matrix semiconductive material having a maximum width less than 1 millimeter, and migrating the liquid body through the matrix body in a straight line from one location to another under the driving force of a thermal gradient to produce a migration trail in the form of a recrystallized region of semiconductive material of second-type semiconductivity and a continuous junction at the interface between the first-type and the second-type semiconductive materials free from junction-bridging fragments of the migrated material.

3,899,362

THERMOMIGRATION OF METAL-RICH LIQUID WIRES THROUGH SEMICONDUCTOR MATERIALS

Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 30, 1973, Ser. No. 411,018

Int. Cl. H01l *7/34*

U.S. Cl. 148—1.5 **19 Claims**

1. A method for migrating a vapor deposited metal wire through a body of semiconductor material comprising the process steps of:

a. selecting a body of semiconductor material so that the body has at least one surface having a preferred planar crystal structure orientation, the vertical axis of the body being substantially aligned with a first axis of the crystal structure;

b. etching selectively the surface having the preferred planar crystal structure orientation to form at least one trough-like depression in the surface in a preferred crystal wire direction which is oriented to substantially coincide with at least one of the other axes of the crystal structure;

c. vapor depositing a layer of a metal in the at least one trough-like depression on the selected surface of the body of semiconductor material;

d. heating the body and the metal to a temperature sufficient to form a liquid wire of metal-rich material in each of the trough-like depressions on the surface of the body;

e. establishing a temperature gradient along substantially the vertical axis of the body and the first axis of the crystal structure, and

f. migrating the metal-rich liquid wire through the body along the first axis of the crystal structure to form a planar region of recrystallized material of the body having solid solubility of the metal of the wire therein to impart a selected type conductivity and a selected level of a resistivity thereto.

3,899,363

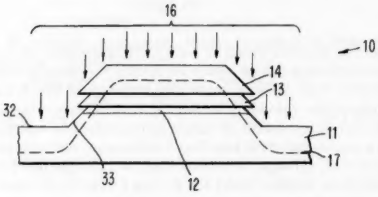
METHOD AND DEVICE FOR REDUCING SIDEWALL CONDUCTION IN RECESSED OXIDE PET ARRAYS

Robert H. Dennard, Croton-on-Hudson; Vincent L. Rideout, Mohegan Lake, and Edward J. Walker, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1974, Ser. No. 484,033

Int. Cl. H01l *9/54*

U.S. Cl. 148—1.5 **6 Claims**



1. A method for fabricating silicon semiconductor devices having reduced subthreshold sidewall conduction between source and drain regions of a field effect transistor surrounded by recessed oxide, including the steps of:

1. providing a substrate having successively deposited thereon a surface portecting layer, an oxidation barrier layer, an ion-implantation blocking layer, and a pattern defining layer;
2. exposing and developing said pattern defining layer to provide a predetermined pattern on said ion-implantation blocking layer;
3. etching said ion-implantation blocking layer according to said predetermined pattern;
4. successively etching said oxide barrier and surface protecting layers in the areas defined by said etched ion-implantation blocking layer;
5. etching said substrate in the exposed areas defined by the oxidation barrier and surface protecting layers with an anisotropic etchant to obtain canted sidewalls in said substrate and which do not appreciably undercut said above layers;
6. ion-implanting said substrate with a p-type dopant beneath the etched out areas and along the canted sidewalls thereof;
7. removing said ion-implantation blocking layer by treating the same with a suitable etchant therefor;
8. subjecting said substrate to thermal oxidation in the areas not protected by said oxidation barrier layer to provide fully recessed oxide areas therein;
9. successively removing said oxidation barrier and surface protecting layers with suitable etchants and thereafter;
10. conventionally fabricating field effect transistors in said above treated substrate.

3,899,364

METHOD OF PRETREATING METAL SURFACES

Albert Edward John Evans, Lovendean; Anthony Norbert Aincough, Ropley, both of England, and Koen Verschoore, Essen, Belgium, assignors to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Filed Oct. 24, 1972, Ser. No. 300,303

Claims priority, application Netherlands, Oct. 22, 1971, 7114590

Int. Cl. C23c *1/10;* **C22b** *;* **B23b** *9/02*

U.S. Cl. 148—6.15 R **27 Claims**

1. A steel surface pre-treated to provide superior rust protection, high lubricity and direct paintability without degreasing, said surface having a first uniform coating of up to 50 milligrams of phosphating agent per square meter of surface and a second uniform coating of an oily material selected from the group consisting of mineral oils, vegetable oils, animal oils and equivalent synthetic oils, said phosphating agent being coated on said surface from an acidic aqueous solution of said phosphating agent, said second coating being applied subsequent to said first coating.

10. A steel surface pre-treated to provide superior rust protection, high lubricity and direct paintability without degreasing, said surface having a uniform coating of up to 50 milligrams of phosphating agent per square meter of surface and at least 150 milligrams of oily material per square meter of surface, said phosphating agent and said oily material being coated on said surface simultaneously, said phosphating agent being coated on said surface from an acidic aqueous solution of said phosphating agent, said oily material being selected from the group consisting of mineral oils, vegetable oils, animal oils and equivalent synthetic oils.

19. A steel surface pre-treated to provide superior rust protection, high lubricity and direct paintability without degreasing, said surface being coated with a phosphating agent and up to 150 milligrams of oily material per square meter of surface, said phosphating agent and said oily material being coated on said surface simultaneously, said phosphating agent being coated on said surface from an acidic aqueous solution of said phosphating agent, said oily material being selected from the group consisting of mineral oils, vegetable oils, animal oils and equivalent synthetic oils.

3,899,365

TREATMENT OF STEEL ROPING WIRE

Raymond Guy, Skellow, near Doncaster, England, assignor to Bridon Limited, Doncaster, England

Filed Aug. 17, 1973, Ser. No. 389,403

Claims priority, application United Kingdom, Aug. 18, 1972, 38614/72

Int. Cl.[2] C23F *7/08*

U.S. Cl. 148—6.15 R **4 Claims**

2. A method of manufacturing steel wire strand or rope from steel wires which are at their final size, comprising the sequential steps of:

cleaning the wires to remove wire-drawing residues,

rinsing the wires with water,

activating the wires, which are still wet, by means of a pre-treatment solution facilitating subsequent formation of a fine-grained manganese coating,

forming a manganese phosphate coating on the wires, which are still wet with the pre-treatment solution,

rinsing the coated wires with water,

drying the wires,

sealing the coating of the wires with a corrosion resistant sealant selected from the group consisting of organic compounds of the oil type (non-setting mineral oils of various weights and viscosities), the solvent type (petroleum base film forming materials and rust inhibitors dissolved in petroleum solvents), emulsifiable type (petroleum base rust preventatives modified to form stable emulsion when mixed with water), wax type, and inor-

ganic sealants of the chromate and dichromate type, and stranding the wires to form a strand.

3,899,366

TREATED SUBSTRATE FOR THE FORMATION OF DROP-WISE CONDENSATES AND THE PROCESS FOR PREPARING SAME

Edward George Tajkowski, Williamsville, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Nov. 5, 1973, Ser. No. 412,991
Int. Cl. C23f 7/26
U.S. Cl. 148—6.16 41 Claims

1. A process for treating a metallic substrate formed of a material selected from the group consisting of copper, aluminum, copper alloys and aluminum alloys to obtain a dropwise condensation promoting surface which process comprises:

a. cleaning the surface of the substrate;

b. applying a first solution comprising chromate ions to the substrate to form a chromate ion treated surface; and

c. applying, to the chromate ion treated surface, a fluorinated compound having a perfluorinated alkyl or alkoxy chain containing at least 6 carbon atoms and having at least one reactive group which is a carboxylic acid or a phosphate.

38. A process for treating a metallic substrate formed of a material selected from the group consisting of copper, aluminum, copper alloys and aluminum alloys to obtain a dropwise condensation promoting surface which process comprises:

a. applying a first solution comprising chromate ions to a clean substrate to form a chromate ion treated surface; and

b. applying, to the chromate ion treated surface a fluorinated compound having a perfluorinated alkyl or alkoxy chain containing at least 6 carbon atoms and having at least one reactive group which is a carboxylic acid or a phosphate.

3,899,367

COMPOSITIONS AND METHODS FOR BLACKENING HARDENED STEEL

Abraham J. Mitchell, Stratford, Conn., assignor to The Mitchell-Bradford Chemical Co., Milford, Conn.

Filed Oct. 24, 1974, Ser. No. 517,485
Int. Cl.² C23F 7/04
U.S. Cl. 148—6.24 9 Claims

5. Process for the blackening of steel, particularly hardened steel, comprising the step of immersing the steel for a period of from about 10 to 25 minutes in an aqueous bath heated to a temperature of from about 255° to 325°F and consisting essentially of an aqueous solution of from 50 to 90 parts by weight of an alkali metal hydroxide, from 0.1 to 50 parts by weight of an alkali metal nitrate, from 0.1 to 50 parts by weight of an alkali metal nitrite, from 0.001 to 20 parts by weight of a cyclic sulphur-containing compound from the group consisting of 2-mercaptobenzothiazole, benzothiazyl disulphide and 2-mercaptoimidazoline, from 0 to 20 parts by weight of a wetting agent, from 0 to 20 parts by weight of a metal salt of a sulfonated dye and from 0.001 to 20 parts by weight of a material from the group consisting of molybdic acid and alkali metal molybdate salts.

3,899,368

LOW ALLOY, HIGH STRENGTH, AGE HARDENABLE STEEL

George M. Waid, Williamsfield, and Robert T. Ault, Shaker Heights, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Dec. 13, 1973, Ser. No. 424,552
Int. Cl. C22c 39/26
U.S. Cl. 148—36 5 Claims

1. Low alloy, high strength, age hardenable, alloy steel consisting essentially in percentage by weight of about: 0.05% C max., 0.3–0.8% Mn, 0.2–0.5% Si, 0.5–1.5% Ni, 1.5–5.0% Cr, 1.5–3.5% Cu, 0.02–0.45% Nb, 0–0.25% each of Mo, Al and Ti, 0–0.005% B, 0.015% P max., 0.02% S max., balance iron except for impurities within commercial tolerances, characterized as hot rolled at about 2,250°–1,850°F and air cooled, and also as thereafter solution treated at about 1,600°–2,200°F and cooled at least as rapidly as air cool, by a Rockwell "C" hardness of about 30 and under, suitable for forming and machining, and as thereafter aged at about 700°–1,100°F by room temperature tensile properties as follows, tensile and yield strengths of about 160–180 and 135 145 ksi, respectively, tensile elongations of about 17–20%,, Charpy impact energies of about 15–30 ft-lbs. and higher, and Rockwell "C" hardnesses of about 35–40.

3,899,369

PROCESS FOR THE PRODUCTION OF MAGNETIC MATERIALS HAVING SELECTIVE COERCIVITY BY USING SELECTED D.C. MAGNETIC FIELDS

David R. Craig, Denver; George M. Lederle, Boulder, and Franklin T. Plante, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 11, 1974, Ser. No. 449,862
Int. Cl.² C21D 1/04; C22B 23/04; H01F 1/02
U.S. Cl. 148—108 3 Claims

1. A method for preparing finely divided magnetic cobalt-phosphorus alloy particles having a W/H_c less than about 1.2 and controlled coercivities in the range of about 500 to 550 oersteds and about 850 to 950 oersteds, said process comprising:

preparing a solution consisting essentially of 35 g/l cobalt sulfate, sodium hypophosphite in an amount selected from the group consisting of 40 g/l and 200 g/l, and sodium citrate in an amount selected from the group consisting of 70 g/l and 35 g/l;

stirring and heating said solution;

adding to said solution a hot solution of 5 g/l of sodium hypophosphite and 300 g/l of 25% by weight polyacrylic acid, said hot solution being added in an amount selected from the group consisting of 0 ml and 200 ml per liter of said cobalt sulfate solution;

adding to said solution 0.1% palladium chloride-hydrochloric acid solution in an amount selected from the group consisting of 20 ml and 10 ml per liter of said initial cobalt sulfate solution;

after about 10 seconds adding to said solution 28% ammonium hydroxide in an amount equal to 100 ml per liter of said original cobalt sulfate solution;

and then reacting said solution in the presence of a D.C. magnetic field of about 600 to 1400 gauss to form magnetic cobalt-phosphorus particles having coercivities in the range of about 500 to 550 oersteds and about 850 to 950 oersteds and a W/H_c less than about 1.2.

3,899,370

METHOD FOR PRODUCING COATED AND AGE HARDENED ALUMINUM OR ALUMINUM-BASED ALLOY MOLDED MATERIALS

Toshiro Takahashi; Toshihiro Nagano; Yasuo Aoshima, all of Shizuoka; Matsuo Suzuki, Yaizu; Shozo Suzuki, Shizuoka, and Teruo Asahina, Fujieda, all of Japan, assignors to Riken Light Metal Industries Co., Ltd., Shizuoka and Kuboko Paint Co., Ltd., Osaka, both of, Japan

Filed Jan. 17, 1973, Ser. No. 324,448
Claims priority, application Japan, Jan. 20, 1972, 47-7230; Jan. 20, 1972, 47-7231; Feb. 17, 1972, 47-16675; Feb. 17, 1972, 47-16676; Feb. 19, 1972, 47-16908
Int. Cl.² C21D 1/00; B32B 15/08
U.S. Cl. 148—159 2 Claims

1. In a method for producing painted molded aluminous material in which an aluminous material is subjected to extrusion molding, the molded material is subjected to an artificial

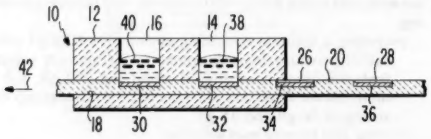
age hardening treatment; to conventional pre-treatments of degreasing, neutralization, washing with water and a surface-roughening treatment; and to a treatment for forming a base layer for painting by (1) anodic oxidation (2) treatment in boiling water or an aqueous solution of a chemical agent for forming a boehmite layer or (3) spraying with steam; the thus treated molded material is coated with a thermosetting paint and the painted molded material is heated to cure the painted film, the improvement which comprises, (a) subjecting the extrussion molded aluminous material in a super-saturated condition and having a hardness of less than 65 kg/mm² and a tensile strength of less than 15 kg/mm² to conventional pretreatments without first effecting artificial age hardening (b) subjecting the pre-treated material to a treatment for forming a base layer for painting (c) coating the material with a film of a thermosetting paint and (d) heat treating the painted material at a temperature of 205±5°C. for 50–120 minutes to effect said age hardening treatment simultaneously with the curing of the painted film.

3,899,371

METHOD OF FORMING PN JUNCTIONS BY LIQUID PHASE EPITAXY

Ivan Ladany, Stockton, and Vincent Michael Cannuli, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed June 25, 1973, Ser. No. 373,462
Int. Cl. H01l *7/38*
U.S. Cl. 148—171 **5 Claims**



1. A method of depositing on a substrate a pair of epitaxial layers of semiconductor material comprising the steps of

providing first and second solutions of a semiconductor material, having substantially the same ratio of elements, dissolved in a heated molten solvent,

bring first and second substrates into contact with said first and second solutions, respectively, so that a surface of each substrate is in contact with its respective solution,

cooling both of said solutions to deposit from each solution a first epitaxial layer of the respective semiconductor material on the respective substrate in the solution, such that the remaining portions of the first and second solutions have substantially equal element ratios, then

removing said substrates from the solutions and moving the first substrate into the second solution so that the first epitaxial layer on the first substrate is in contact with the second solution, and then

further cooling said second solution to deposit from said second solution a second epitaxial layer of the semiconductor material on the first epitaxial layer on the first substrate.

3,899,372

PROCESS FOR CONTROLLING INSULATING FILM THICKNESS ACROSS A SEMICONDUCTOR WAFER

Ronald Philip Esch, and Patrick Chin-Sheng Huang, both of Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

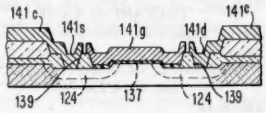
Filed Oct. 31, 1973, Ser. No. 411,518
Int. Cl. H01l *7/44*
U.S. Cl. 148—187 **9 Claims**

1. A process for fabricating semiconductor devices comprising the steps of:

a. depositing an initial insulating film on the surface of a semicondutor substrate of a first conductivity type,

b. forming openings in the insulating film to expose the substrate surface,

c. forming regions of a second conductivity type within the openings and in the substrate,



d. reforming the insulating film in the openings and entirely across the wafer to be of a substantially planar configuration, and,

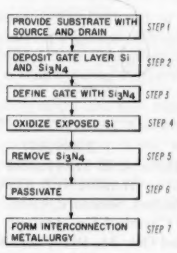
e. forming an opening through the substantially planar insulating film to attach an electrode to the substrate.

3,899,373

METHOD FOR FORMING A FIELD EFFECT DEVICE

Igor Antipov, Pleasant Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 20, 1974, Ser. No. 471,401
Int. Cl.² H01L *21/265*
U.S. Cl. 148—187 **11 Claims**



1. A method for fabricating an insulated gate field effect transistor device comprising

a. providing a semiconductor substrate of a first conductivity type having at least source and drain regions of a second opposite conductivity type, and a field layer of insulating material on the surface having at least the gate area open between the source and drain regions,

b. forming a first thin blanket layer of an insulating material having a thickness of at least 100 Angstroms on the surface of said substrate,

c. depositing a second blanket layer of silicon material over said layer of insulating material,

d. depositing a third blanket layer of Si_3N_4 and a fourth blanket layer of SiO_2 over said silicon layer,

e. removing by photolithographic techniques areas of said third and fourth blanket layers of Si_3N_4 and SiO_2 over the field regions leaving areas at least over the gate regions,

f. oxidizing the exposed areas of said third silicon layer in their entirety forming a layer of thermal SiO_2,

g. removing the remaining areas of SiO_2 and underlying Si_3N_4 thereby uncovering the gate electrode,

h. depositing a fifth blanket passivating layer of an insulating material on the surface of the resultant device,

i. forming contact openings to at least said source and drain regions, and

j. forming an interconnection metallurgy system.

3,899,374

CALCIUM NITRATE EXPLOSIVE COMPOSITION

Thomas E. Sylkhouse, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 29, 1974, Ser. No. 456,083

Int. Cl. C06b *19/00*

U.S. Cl. 149—2 23 Claims

1. An explosive composition which comprises, at least about 50 percent, as percent by weight, of the following mixture:

a. from about 51 to about 85 percent of inorganic oxidizing salts consisting essentially of ammonium nitrate and calcium nitrate wherein calcium nitrate consists of from about 53 to about 95 percent of said inorganic oxidizing salts;

b. from about 9 to about 35 percent of at least one water miscible organic fuel; and

c. from about 5 to about 21 percent of water, said composition having an oxygen balance ranging from about +20 grams to about −8 grams of oxygen per 100 grams of said mixture, said weight ratio of said water miscible organic fuel to calcium nitrate in said mixture ranging from about 0.80 to about 0.20 and sufficient gaseous voids incorporated in said mixture to provide a bulk density ranging from about 0.80 to 1.40 gm/cc.

3,899,375

METALLIC PHOSPHIDE COMPOSITION FOR USE IN AQUATIC FLARES

Malcolm George Palmer, Blakedown, Near Kidder Winster, England, assignor to Erco Industries Ltd., Islington, Canada

Continuation of Ser. No. 46,996, June 17, 1970, abandoned. This application Apr. 27, 1973, Ser. No. 355,194

Claims priority, application United Kingdom, June 20, 1969, 31293/69

Int. Cl. C06d *1/10*; C06c *9/00*

U.S. Cl. 149—29 2 Claims

1. A phosphide composition which upon contact with sea water releases phosphine gas in high yield, said phosphine gas being readily self-inflammable when contacted with air, said phosphide composition comprising the reaction product prepared by reacting aluminium and sodium with phosphorus in the absence of oxygen, and recovering the said reaction product.

3,899,376

PROCESS OF USING A MICROBIAL DEGRADATION FACILITY

Edward N. Azarowicz, Vienna, Va., assignor to Bioteknika International, Inc., Alexandria, Va.

Filed Feb. 23, 1973, Ser. No. 334,986

Int. Cl. C12b *1/00*

U.S. Cl. 195—2 22 Claims

1. A process for the microbial degradation of polluting petroleum and oily wastes which comprises introducing an aqueous mixture of the effluent material to be degraded and at least one microorganism selected from the group consisting of *Candida parapsilosis* ATCC 20246, *Candida tropicalis* ATCC 20247, *Candida utilis* ATCC 20248, *Aureobasidium pullulans* ATCC 20249, *Myrothecium verrucaria* ATCC 20250, *Cladosporium cladosporioides* ATCC 20251, *Saccharomyces cerevisiae* ATCC 20252, *Aspergillus sp.* ATCC 20253, *Rhodotorula sp.* ATCC 20254, *Candida lipolytica* ATCC 20255, *Candida lipolytica*, ATCC 20362, *Candida lipolytica* ATCC 20363, *Candida lipolytica* ATCC 20364, *Nocardia corallina* ATCC 21504, *Nocardia globerula* ATCC 21505, *Nocardia globerula* ATCC 21506, *Nocardia opaca* ATFC 21507, *Nocardia rubra* ATCC 21508, *Nocardia paraffinae* ATCC 21509 and *Penicillium sp.* ATCC 20369, or mutants thereof, together with necessary nutrients for the microorganisms into an initial degradation system, aerating or stirring the mixture in the initial degradation system until the microbial action has proceeded sufficiently to substantially degrade the pollutants in said effluent, conveying the substantially degraded effluent to a final degradation system and adding a fresh charge of at least one of said microorganisms together with nutrients therefor to the final degradation system for a time sufficient to permit the microbial action to proceed to the point where the desired degradation is obtained, and conveying the degraded effluent from said final degradation system.

3,899,377

BONDING ALUMINIUM

Penelope Jane Vesey Luc, 18, rue Fourcroy, Paris 17e, France

Continuation of Ser. No. 191,080, Oct. 20, 1971, abandoned, and a continuation-in-part of Ser. No. 830,831, June 5, 1969, abandoned. This application July 9, 1974, Ser. No. 486,845

Int. Cl. B29c *27/08*; B23k *27/00*

U.S. Cl. 156—73.5 16 Claims

1. A method of bonding aluminum to a material of the group consisting of a paper and a non-resinous cloth, the bonding occurring at a predetermined area of the aluminum and the material at which a bond is desired, comprising the steps of:

i. subjecting at least one of the surfaces of:

a. the aluminum to be bonded, the surface of the aluminum, excluding the predetermined area of the surface of the aluminum at which bonding is desired and consisting of at least one of at least:

1. the portion of the surface of the aluminum adjacent to, and

2. the portion of the surface of the aluminum substantially opposite to the predetermined area of the surface of the aluminum at which bonding is desired, and

b. a layer of solid material adjacent a surface opposite the surface having the predetermined area, of one of:

1. the aluminum having the predetermined area at which bonding is desired, at the predetermined area, and

2. the material of the group at the predetermined area of the material at which bonding is desired,

to a frictional treatment, the frictional treatment comprising the subjection of the at least one surface to dynamic friction created by a rotary tool in contact with the at least one surface.

ii. bringing the predetermined area of the surface of the aluminum at which bonding is desired into intimate contact with the predetermined area of the surface of the material of the group at which bonding is desired, and

iii. maintaining the predetermined areas of the surfaces of the aluminum and the material in intimate contact at least during the step of subjecting,

whereby the aluminum and the material are bonded in the predetermined area.

3,899,378

METHOD OF PRODUCING RUBBER-PLASTICS COMPOSITES

Reginald Trevor Wragg, Tamworth, and James Frank Yardley, Shenston, near Lichfield, both of England, assignors to Dunlop Limited, London, England

Filed Mar. 5, 1974, Ser. No. 448,266

Claims priority, application United Kingdom, Mar. 9, 1973, 11591/73

Int. Cl.[2] B32B *31/20*

U.S. Cl. 156—73.5 12 Claims

1. A method of producing a rubber-plastics composite by relative movement of a thermoplastic plastics component in friction contact with a compatible vulcanized rubber component until the plastics surface in contact with the rubber component melts, and

then allowing the plastics surface to solidify in contact with the rubber component, said compatible plastics and rubber components selected from the group consisting of substantially linear crystalline low pressure solution olefin polymers with ethylene/alpha-mono-olefin copolymer or ethylene/alpha-mono-olefin/diolefin terpolymer compositions containing up to 70 percent polymer; low density polyethylene or a crystalline copolymer of ethylene with a vinyl alkanoic ester, an alkyl acrylate or a vinyl halide, with ethylene/alpha-mono-olefin copolymer or ethylene/alpha-mono-olefin/diolefin terpolymer compositions containing up to 55 percent polymer; poly(ethylene terephthalate) or poly(tetramethylene terephthalate) with polyepichlorhydrin, styrene/butadiene rubber, nitrile rubber, polybutadiene rubber or epichlorhydrin-/ethylene oxide rubber; polar elastoplastic linear block copolymers containing polyester blocks and polyether blocks with polyepichlorhydrin, epichlorhydrin/ethylene oxide rubber, natural rubber, styrene/butadiene rubber, nitrile rubber, polyurethane rubber, acrylate rubber, polychloroprene, propylene oxide/unsaturated epoxide rubber or polybutadiene rubber; polyamides with polyepichlorhydrin, sulphur-cured polyurethane, nitrile rubber, vinylidene fluoride fluoro-elastomer, natural rubber, polychloroprene, trans-polypentenamer, styrene/butadiene rubber or polybutadiene rubber; polycarbonates with nitrile rubber, polyepichlorhydrin or polybutadiene rubber; vinyl chloride polymers with nitrile rubber; poly(vinylidene fluoride) with acrylate rubber; styrene/acrylonitrile copolymer with nitrile rubber; methyl methacrylate resin with polyepichlorhydrin or nitrile rubber; poly(chlorotrifluoroethylene) with stryene/butadiene rubber; polyurethane plastics with styrene/-butadiene rubber or natural rubber; and polyformaldehyde with polyepichlorhydrin or epichlorhydrin/ethylene oxide rubber.

3,899,379

RELEASABLE MOUNTING AND METHOD OF PLACING AN ORIENTED ARRAY OF DEVICES ON THE MOUNTING

William R. Wanesky, Wescosville, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 64,898, July 30, 1970, Pat. No. 3,690,984, which is a division of Ser. No. 729,859, April 10, 1968, which is a continuation-in-part of Ser. No. 673,900, Oct. 9, 1967, abandoned. This application Mar. 8, 1972, Ser. No. 232,735

Int. Cl. B29b *3/00;* **B29c** *27/00;* **B32b** *25/20*

U.S. Cl. 156—80 **7 Claims**

1. A method of transferring an oriented array of articles, which comprises:

releasably supporting the articles in said oriented array with at least one surface on each article exposed;

abutting against said exposed surfaces of said articles a carrier constructed of material selected from the group consisting of silicone rubber and silicone resin, each of which exhibits pressure sensitive, vacuum holding properties; and then

releasing the supported articles to vacuum hold them in the original orientation of the carrier.

2. A method of transferring an array of articles from a support plate onto a carrier constructed of material having pressure sensitive, vacuum holding properties, wherein said material is selected from the group consisting of silicone rubber and silicone resin, which comprises:

applying a hardenable material over said array of articles and hardening the material to secure the articles in positionn;

removing the support plate to expose the undersurfaces of said secured articles;

placing said carrier against the exposed undersurfaces of said articles to vacuum hold said articles to said carrier; and then

removing said hardenable material to release and leave said articles held against said carrier.

3,899,380

METHOD OF MAKING ACOUSTICAL MATERIAL

Lance W. Pihlstrom, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 121,560, March 5, 1971, Pat. No. 3,773,605. This application May 21, 1973, Ser. No. 361,948

Int. Cl.[2] B32B *5/26, 5/28, 31/20*

U.S. Cl. 156—181 **3 Claims**

1. A method of making a rigid light-weight open porous integrated acoustical material in block form, which comprises selecting open porous webs of loosely raveled filament forming thermoplastic organic fibers having a diameter within a range of 0.2 and 25 microns and a length of at least about 0.5 cm, stacking at least eight of said webs one on top of another to form a loose pile, and, without external heat or binder, compressing said pile for a time and at a pressure sufficient to cause fusing of contacting fibers in said pile and to produce integration and compaction of said pile to form a unitary structure having a flexural strength of at least 100 pounds per square inch and a uniform density.

3,899,381

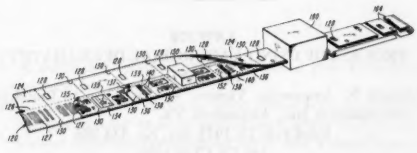
DIRECT MAIL ADVERTISING BOOKLET AND METHOD OF PRODUCTION

William J. O'Brien, Plandome Heights, N.Y., and John Sakal, Dayton, Ohio, assignors to The Standard Register Company, Dayton, Ohio

Filed Feb. 7, 1973, Ser. No. 330,214

Int. Cl. B42c *3/00;* **B41l** *1/30;* **B31f** *1/00*

U.S. Cl. 156—204 **10 Claims**



1. A high speed method of producing booklets having personalized addresses thereon, comprising the steps of printing a continuous cover paper strip with repetitive information along the length thereof, the cover paper strip having a first half portion and a second half portion, forming a series of longitudinally spaced apertures within the first half portion of said cover paper strip, printing at least one continuous insert paper strip with repetitive information along the length thereof, the insert paper strip having a width substantially one-half that of said cover paper strip, collating the insert paper strip into superposed relation with the second half portion of the cover paper strip, attaching one longitudinal edge portion of the insert paper strip to the longitudinal center portion of the cover paper strip, personalized addressing the insert paper strip at longitudinally spaced intervals with different addresses, folding the first half portion of the cover paper strip over onto the insert paper strip for exposing a personalized address through each aperture and to form a continuous series of booklets, and severing the collated strips at longitudinally spaced intervals to separate the booklets.

3,899,382
ANAEROBIC BONDING AGENT

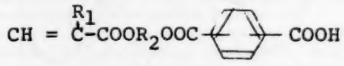
Hideaki Matsuda, 2-738, Tsunomori-cho, Marugame-shi, Kagawa-ken, and Takanori Okamoto, 7-651, Hukami, Horie, Ouza, Tadotsu-cho, Nakatado-gun Kagawa-ken, both of Japan

Filed Mar. 8, 1973, Ser. No. 339,065
Int. Cl. C09j *3/16, 5/00*
U.S. Cl. 156—327 **7 Claims**

1. An anaerobic bonding agent which comprises an admixture of

a. an organic peroxide,

b. a polyvalent metal salt of a compound of the formula:



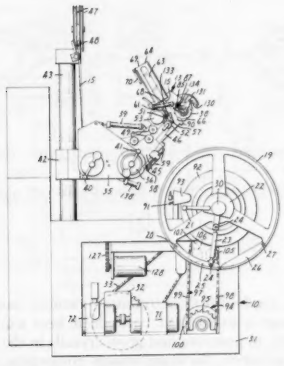
wherein R_1 is hydrogen or methyl, R_2 is an aliphatic or aromatic polyhydric alcohol residue which can be substituted with halogen, —OH or contain an —O— bond,

c. a compound containing an acrylic or methacrylic group selected from the group consisting of alkyl esters of acrylic or methacrylic acid, mono or polyacrylate esters of mono or polyhydric alcohols, mono or poly-methacrylate esters of mono or polyhydric alcohols, or polyester acrylates.

3,899,383
STRIP APPLYING DEVICE

Thomas E. Schultz, Roseville, and Peter W. Schuchardt, May Twp., both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 15, 1974, Ser. No. 451,684
Int. Cl. B29h *17/00;* **B60c** *13/00;* **G11b** *15/58*
U.S. Cl. 156—394 **10 Claims**



1. In a device adapted for adhesively applying lengths of elastic reflex-reflective strip material to tire casings from a supply of the strip material having a protective liner applied thereto, said device comprising means adapted for driving a said tire casing past an applying station; an applying head including a frame, an applying wheel rotatably mounted on said frame, and means for defining a path for said strip material along said frame including a predetermined arcuate path portion relative to said frame defined partially around said applying wheel; liner stripping means for stripping the liner from the strip material along said path in advance of said applying wheel; and means for mounting said applying head at an applying position with said wheel pressing tape along said path portion against the tire casing at said applying station to apply strip material as the tire casing is driven past the applying station, the improvement wherein said device includes:

a vacuum column defining a portion of said path adjacent said applying wheel, said vacuum column having a chamber with open and closed ends adapted for receiving a U-shaped supply length of said strip material through said open end to form a loose fitting air seal between said open and closed ends;

means for providing air under less than atmospheric pressure at the closed end in said chamber to support the U-shaped length therein;

sensing means along said chamber for sensing the position of said U-shaped length of strip material within said chamber;

strip drive means along said path and in driving engagement with said strip material prior to said vacuum column for driving said strip along said path; and

control means connected to said sensing and strip drive means and responsive to the position of said U-shaped length of strip material in said vacuum column for operating said strip drive means to maintain a U-shaped supply length of material in said chamber as strip material is applied around a tire casing;

said liner stripping means and said strip drive means comprising:

a first roller having a cylindrical peripheral surface about an axis;

a second roller having cylindrical peripheral surface portions about an axis and at least two flatted peripheral surface portions, said first and second rollers being in an axially parallel relationship with a nip therebetween defining a portion of said path with the liner on the strip material adjacent the second roller, and being spaced to provide driving engagement on opposite surfaces of said lined strip material positioned in said nip when one of said circular peripheral surface portions is at said nip, said flatted peripheral surface portions affording movement of the strip material relative to the periphery of the rollers when one of said flatted peripheral surface portions is at said nip;

means for individually driving said first and second rollers in opposite rotational directions to propel strip material in said nip toward said vacuum column when one of said cylindrical peripheral surface portions is at said nip;

means for pressing the separated strip material into continuous driving engagement with the periphery of said first roller at a position spaced around the periphery thereof from said nip; and

an idler roller spaced around the periphery of said second roller from said nip and spaced from said second roller to provide driving engagement with said liner therebetween when one of said circular peripheral surface portions is adjacent said idler roller and to afford movement of the liner relative to said second roller when one of said flatted peripheral surface portions is opposite said idler roller, said flatted peripheral surface portions on said second roller being spaced so that at an adjust position of said second roller during each revolution thereof, one flatted peripheral surface portion is at the nip between said first and second rollers, while the other flatted peripheral surface portion is opposite said idler roller so that the drive means will provide said means for stripping the liner from the strip material when the lined strip material is fed through the nip between the driven first and second rollers with the strip material then extending along the periphery of the first roller to said pressing means and the liner extending along the periphery of the second roller to the idler roller, and any slack accumulated in the strip material and liner on the peripheries of the first and second rollers will be removed by slippage caused from tension in the supply length when said second roller rotates through said adjust position.

3,899,384

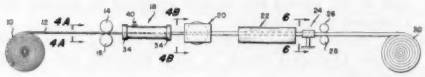
APPARATUS FOR MANUFACTURING A TENDON

William F. Kelly, 100 Bellaire Dr., New Orleans, La. 70124

Division of Ser. No. 94,247, Dec. 2, 1970. This application Jan. 3, 1972, Ser. No. 214,983

Int. Cl.[2] **B29C** *19/00*; **B29B** *7/14*; **B65H** *81/00*

U.S. Cl. 156—433 **7 Claims**



1. Apparatus for manufacturing a tendon embodying a strand of wire encased in a lubricant covered by a protective jacket for use in the post-tensioning of prestressed concrete, said apparatus including:

a. feed means for advancing the strand of wire at a constant, predetermined speed,

b. means for applying a lubricant of grease-like consistency and predetermined thickness to the periphery of said strand of wire,

c. said means comprising an elongated housing providing a lubricant reservoir,

d. means for forcing lubricant under pressure into the reservoir,

e. inlet and outlet means at opposite ends of said housing for passing the strand of wire longitudinally through the reservoir, whereby the lubricant adheres to the outer periphery thereof,

f. die means within said housing adjacent said outlet means for gauging a lubricant envelope of uniform predetermined thickness to the strand of wire prior to passing from said housing,

g. guide means within said housing reservoir adjacent said die means for urging the lubricant in the direction of the strand of wire, and

h. means for applying a protective jacket to the outer periphery of the lubricant envelope in spaced relation to the strand of wire.

3,899,385

APPARATUS FOR APPLYING LABELS COATED WITH PRESSURE-SENSITIVE ADHESIVE

Friedhelm Brinkmeier, Ladbergen, Germany, assignor to Windmoller & Holscher, Lengerich, Germany

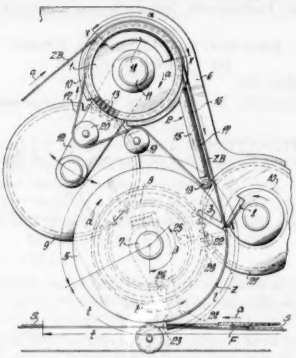
Filed July 18, 1973, Ser. No. 380,198

Claims priority, application Germany, Aug. 8, 1972, 2237846

Int. Cl. B65c *9/14*

U.S. Cl. 156—521 **5 Claims**

1. Apparatus for sticking labels coated with pressure-sensitive adhesive on articles which are moved past the apparatus in synchronism therewith, particularly for sticking end labels of plastics material sheeting on the folded ends of bags to protect and reinforce said ends, comprising feeding means for a continuous feeding of a label web, which is unilaterally coated with pressure-sensitive adhesive, and a continuously rotating applying roller which succeeds said feeding means and is provided with vacuum-applying means at its periphery and cooperates with a cross-cutter in such a manner that the labels are severed from the label web and are stuck on the folded ends of the articles, which are tangentially moved past the applying roller in synchronism therewith, said applying roller revolving at a higher peripheral velocity than the feeding means, characterized in that the means for feeding the label web comprises a continuously rotating vacuum drum, which is contacted by the label web on its uncoated side, and a flat vacuum-applying member, which extends approximately in the direction of the common tangent to the vacuum drum



and applying roller and is covered by at least one driven endless vacuum belt.

3,899,386

METHOD FOR CONTROLLING VACUUM PAN

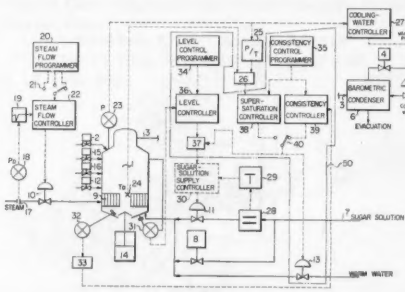
Shigeo Komiyama; Ichiro Matsubara, both of Katsuta, and Masatake Shiraishi, Koriyama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 29, 1972, Ser. No. 319,938

Claims priority, application Japan, Dec. 29, 1971, 47-3075

Int. Cl. B01d *1/00*; **B01j** *17/00, 17/02*; **B01d** *3/42*; **C13f** *1/02*

U.S. Cl. 159—47 R **26 Claims**



1. In a method for controlling a vacuum pan according to which heat is exchanged between a heat exchanger and a massecuite to generate and grow crystals in the massecuite in a batch operation, the improvement comprising (a) measuring the inter-crystal gap length of the crystals grown in the solution and controlling the quantity of the supply of the solution on the basis of the measured inter-crystal gap length to effectively grow crystals, and (b) measuring the value of at least one other parameter indicative of the progress of the crystal growing process, comparing the measured inter-crystal gap length with a programmed value for the inter-crystal gap length provided by a first program, comparing the measured value of said other parameter with a programmed value for said other parameter provided by a second program, automatically preferentially selecting either said first program or said second program for controlling said supply quantity, and controlling said supply quantity on the basis of the deviation of the measured value from the programmed value of the parameter corresponding to the selected program.

3,899,387

PROCESS OF MAKING PAPER USING MONO-ISOCYANATE CAPPED POLY (OXYALKYLENE) DIOLS AS A RE-WETTING AND DEFOAMING AGENT

Richard E. Freis, Minneapolis, and Larry M. Rue, Inver Grove Heights, both of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Filed Apr. 11, 1973, Ser. No. 350,004
Int. Cl.[2] D21H *3/12*
U.S. Cl. 162—158 5 Claims

1. In a method for increasing the hydrophilic properties of a waterlaid sheet and providing a de-foaming action during the formation of the waterlaid sheet on a paper-making machine, said waterlaid sheet being formed from a paper-making slurry, the improvement which comprises the steps of:

a. treating the fibers in said paper-making slurry, and de-foaming said paper-making slurry, with an effective amount of a re-wet composition, having de-foaming properties, the active portion of said re-wet composition comprising at least about 25% by weight of a diaryl urethane having a cloud point, at 1 weight percent in water, below 45°C., and having the following structural formula:

$$Ar—NH—CO—O—(AO)_n—CO—NH—Ar'$$

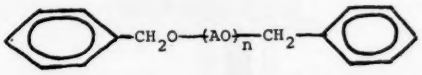
wherein

Ar and Ar′ are monovalent aryl groups free of —NCO radicals,

A is an alkylene group containing 2–4 carbon atoms, n is a number greater than 3 selected such that the divalent radical $(AO)_n$ has a molecular weight less than 12,000, and

$(AO)_n$ is a block copolymer containing at least one block of oxypropylene units,

said effective amount being an amount sufficient to lower the re-wet time of said waterlaid sheet to less than 200 seconds as determined by the re-wet test in which a drop of water is added to a sample of said waterlaid sheet and the time needed to absorb the drop is noted; the defoaming action of said diaryl urethane, at 75°F., being at least about equal to the defoaming action of the compound



wherein

A, *n*, and $(AO)_n$ have the previously indicated significance; and

b. depositing the thus-treated fibers on a foraminous surface.

3,899,388

TREATING COMPOSITIONS

John P. Petrovich, and David L. Taylor, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 26, 1973, Ser. No. 335,614
Int. Cl. D21d *3/00*
U.S. Cl. 162—164 19 Claims

1. A composition for increasing the wet and dry strength of paper comprising

I. an uncured, thermosetting resinous reaction product of

A. an adduct of

1. a dihaloalkane represented by the formula

$$X—CH_2—(CH_2)_n—CH_2—X$$

wherein X represents chloro, bromo or iodo, R is hydrogen, hydroxy or alkyl group having 1 to 4 carbon atoms, and *n* is 0 or 1 and

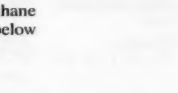
2. a polyalkylenepolyamine represented by the formula

$$H_2N(C_mH_{2m}NH)_pC_mH_{2m}NH_2$$

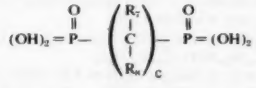
wherein *m* is an integer of from 4 to about 15 and *p* is 0 or 1 in a mole ratio of from about 0.5:1 to about 0.95:1 and

B. an epihalohydrin selected from the group consisting of epichlorohydrin, epibromohydrin, and epiiodohydrin, in a mole ratio of from about 1.25 to about 2.5 moles of epihalohydrin per mole of amine group in said adduct, said reaction product being present in an amount of from about 5% by weight to about 40% by weight based on the total weight of the composition,

II. a polyanionic phosphorus compound, present in an amount of from about 0.1% to about 20% by weight, based on the weight of said resinous reaction product selected from the group consisting of (a)



wherein R_3 and R_4 each independently is hydrogen or an alkyl group containing 1 to 4 carbon atoms, (b) water soluble salts thereof, (c)



wherein *c* is an integer from 1 to 30, R_7 represents hydrogen or lower alkyl, R_8 represents hydroxyl, hydrogen or lower alkyl, (d) water soluble salts thereof, and

III. water, in an amount of from about 60 to 95% by weight, based on the total weight of the composition.

10. A cellulosic substrate having improved wet and dry strength which comprises a cellulosic substrate containing

I. about 0.1 to about 5 weight percent based on the dry weight of the cellulosic fibers of a thermosetting resinous reaction product of

A. an adduct of

1. a dihaloalkane represented by the formula

$$X—CH_2—(CH_2)_n—CH_2—X$$

wherein X represents chloro, bromo, or iodo, R is hydrogen, hydroxy or an alkyl group having 1 to 4 carbon atoms, and *n* is 0 or 1 and

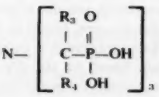
2. a polyalkylenepolyamine represented by the formula

$$H_2N(C_mH_{2m}NH)_pC_mH_{2m}NH_2$$

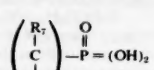
wherein *m* is an integer of from 4 to about 15 and *p* is 0 or 1 in a mole ratio of from about 0.5:1 to about 0.95:1 and

B. an epihalohydrin selected from the group consisting of epichlorohydrin, epibromohydrin, and epiiodohydrin, in a mole ratio of from about 1.25 to about 2.5 moles of epihalohydrin per mole of amine group in said adduct, and

II. a polyanionic phosphorus compound present in an amount of from 0.1% to about 20% by weight based on the weight of said resinous reaction product selected from the group consisting of (a)



wherein R_3 and R_4 each independently is hydrogen or an alkyl group containing 1 to 4 carbon atoms, (b) water soluble salts thereof, (c)



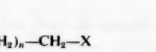
wherein c is an integer from 1 to 30, R_7 represents hydrogen or lower alkyl, R_8 represents hydroxyl, hydrogen or lower alkyl, (d) water soluble salts thereof, said resinous reaction product having been cured after application of both the resinous reaction product and polyanionic phosphorus compound to the cellulosic substrate.

18. A method for producing paper having improved wet and dry strength which comprises applying to said paper a composition comprising

I. an uncured, thermosetting resinous reaction product of

A. an adduct of

1. a dihaloalkane represented by the formula



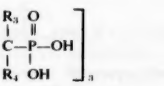
wherein X represents chloro, bromo or iodo, R is hydrogen, hydroxy or alkyl group having 1 to 4 carbon atoms, and n is 0 or 1 and

2. a polyalkylenepolyamine represented by the formula $H_2N(C_mH_{2m}NH)_pC_mH_{2m}NH_2$

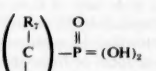
wherein m is an integer of from 4 to about 15 and p is 0 or 1 in a mole ratio of from about 0.5:1 to about 0.95:1 and

B. an epihalohydrin selected from the group consisting of epichlorohydrin, epibromohydrin, and epiiodohydrin, in a mole ratio of from about 1.25 to about 2.5 moles of epihalohydrin per mole of amine group in said adduct, said reaction product being present in an amount of from about 5% by weight to about 40% by weight based on the total weight of the composition.

II. a polyanionic phosphorus compound, present in an amount of from about 0.1% to about 20% by weight, based on the weight of said resinous reaction product selected from the group consisting of (a)



wherein R_3 and R_4 each independently is hydrogen or an alkyl group containing 1 to 4 carbon atoms, (b) water soluble salts thereof, (c)



wherein c is an integer from 1 to 30, R_7 represents hydrogen or lower alkyl, R_8 represents hydroxyl, hydrogen or lower alkyl, (d) water soluble salts thereof, and

III. water, in an amount of from about 60 to 95% by weight, based on the total weight of the composition, and thereafter curing said resinous reaction product, said composition being present in an amount to provide from about 0.1 to about 5 weight percent, based on the dry weight of the cellulosic fibers of said reaction product, and from 0.1 to about 20 percent based on the dry weight of the paper fibers of said polyanionic phosphorus compound.

3,899,389

CELLULOSIC MATERIALS INTERNALLY SIZED WITH COPOLYMERS OF ALPHA BETA-ETHYLENICALLY UNSATURATED HYDROPHOBIC MONOMERS AND AMMONIATED CARBOXYLIC ACID COMONOMERS

Walter Lee Vaughn, Lake Jackson, and Robert James Beam, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 1, 1974, Ser. No. 438,913

Int. Cl. C08g *45/18*

U.S. Cl. 162—168 **21 Claims**

1. In a method for internal sizing of a cellulosic material wherein an internal sizing agent and a retention aid are applied to the fibers of the cellulosic material, the improvement wherein the internal sizing agent is a water-dispersible, water- and alkali-insoluble copolymer of an α,β-ethylenically unsaturated hydrophobic monomer and an ammoniated α,β-ethylenically unsaturated carboxylic acid and the retention aid is a water dispersible reaction product of epihalohydrin and ammonia, or an aliphatic polyamine having at least two amine hydrogens per molecule or a mixture of ammonia and aliphatic polyamine.

3,899,390

MEASURING APPARATUS FOR THE COOLANT OUTLET TEMPERATURE IN NUCLEAR-REACTOR FUEL ELEMENTS

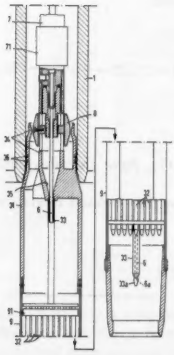
Klaus-Wilhelm Klein, Erlangen, and Peter Rau, Mittelehrenbach, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 12, 1972, Ser. No. 261,656

Claims priority, application Germany, June 14, 1971, 2129438

Int. Cl. G21c *17/02*

U.S. Cl. 176—19 R **3 Claims**



1. A nuclear reactor having a fluid pressure chamber in which a fuel element is suspended by a tubular attachment rod extending from the outside of said chamber downwardly to its inside, said element having an attachment head to which the lower end of said rod is attached and said head having a passage extending downwardly therethrough and aligned with the inside of said rod, and from which head an elongated enclosure depends and wherein spaced below said head and within said enclosure a fuel rod support plate is positioned from which a multiplicity of fuel rods depend, said head forming a coolant inlet for said enclosure and the enclosure's bottom end being open for downward flow of coolant therethrough; a guide tube having an inside aligned with the lower end of

said head's passage and depending from said head through said support plate and said fuel rods to below the lower ends of the fuel rods, said guide tube having a bottom end positioned within said downward flow of coolant, means for transmitting information about said coolant at said guide tube's bottom end extending upwardly through said guide tube and said attachment head and said attachment rod to the outside of said fluid pressure chamber which transmitting means can be slidably inserted into and withdrawn from said chamber, and means for preventing the escape of fluid from said pressure chamber via said guide tube, attachment head and attachment rod.

3,899,391

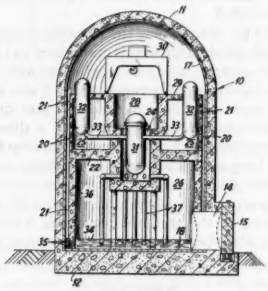
CONTAINMENT VESSEL CONSTRUCTION FOR NUCLEAR POWER REACTORS

Hans D. Sulzer, Winterthur, Switzerland, and Joseph L. Coletti, Quincy, Mass., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Continuation of Ser. No. 74,796, Sept. 23, 1970, abandoned, which is a continuation-in-part of Ser. No. 717,073, March 29, 1968, abandoned. This application June 12, 1973, Ser. No. 369,186

Int. Cl. G21c *9/00*

U.S. Cl. 176—37 **4 Claims**



1. A containment vessel construction for nuclear power reactors with pressure suppression, comprising:

outer containment means for housing a nuclear reactor vessel and associated steam generators;

an inner housing structure within said outer containment means,

said inner housing structure having an outer wall secured to the floor of said outer containment means and extending upwardly therefrom in closely-spaced relationship to the inner peripheral surface of said outer containment means to form a relatively small annulus therebetween;

said inner housing structure divided by a gas-tight intermediate floor member into upper and lower chambers, said upper chamber being in open communication with the space contained by said outer containment means and also with said annulus;

said outer wall of inner housing structure extending in a substantially continuous, straight, vertical line from the portion thereof surrounding said upper chamber to the portion thereof surrounding said lower chamber, said portion of said outer wall of said inner housing structure surrounding said lower chamber being gas-tight;

said nuclear reactor vessel and associated steam generators mounted within said upper chamber;

a pressure suppression pool provided in said lower chamber directly beneath said upper chamber;

a plurality of inlet openings distributed in the lower portion of said outer wall of said inner housing structure communicating said lower chamber with said annulus; and

said pressure suppression pool contained in said lower chamber extending to a level at least above said inlet openings, whereby in the event of a vapor and gas producing accident within said upper chamber said gases and vapors are conducted upwardly into said space contained by said outer containment means and thence downwardly through said annulus and said inlet openings into said pressure suppression pool.

3,899,392

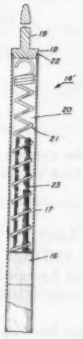
NUCLEAR FUEL ELEMENT CONTAINING PARTICLES OF AN ALLOYED Zr, Ti AND Ni GETTER MATERIAL

Leonard N. Grossman, Wilmington, N.C., and Harry A. Levin, Livermore, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Dec. 8, 1971, Ser. No. 205,789

Int. Cl. G21c *3/18;* **H01j** *7/18*

U.S. Cl. 176—68 **18 Claims**



1. A nuclear fuel element which comprises an elongated container, a body of nuclear fuel material disposed in and partially filling said container and forming an internal cavity, an end closure integrally secured and sealed at each end of said container, a helical member positioned in the cavity, a hollow, gas-permeable container disposed within said cavity and having therein a multiplicity of particles of a ternary alloy, the alloy being comprised of from about 3 to about 12 weight percent nickel, of greater than 3 to about 30 weight percent titanium and the balance is zirconium, and the alloy being a getter material for water, water vapor and reactive gases.

3,899,393

NUCLEAR REACTOR ASSEMBLY

Heinrich Dorner; Manfred Scholz, and Axel Jungmann, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 22, 1973, Ser. No. 362,833

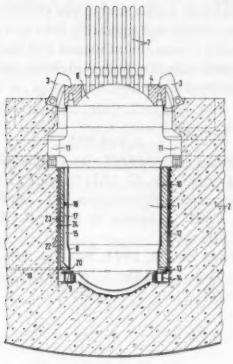
Claims priority, application Germany, May 31, 1972, 2226574

Int. Cl. G21c *17/00, 11/00*

U.S. Cl. 176—87 **7 Claims**

1. A nuclear reactor assembly including a reactor pressure tank having a substantially cylindrical side wall and a biological shield having a cylindrical cavity forming a wall surrounding said side wall; wherein the improvement comprises a rota-

tive substantially cylindrical wall interposed between the aforesaid walls and having means for rotating it from outside



of said shield, and a probe carried by said rotative wall for monitoring said pressure tank's wall.

3,899,394

PRODUCTION OF ANTIBACTERIAL AGENTS

David Willner, Dewitt, and Leonard Bruce Crast, Jr., Clay, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 318,340, Dec. 26, 1972. This application Feb. 21, 1974, Ser. No. 439,508

Int. Cl.[2] C12D *1/00*

U.S. Cl. 195—29 **10 Claims**

1. A process for the production of 7-[D-α-amino-α-(4-hydroxyphenyl)acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid or a salt thereof which comprises contacting methyl D-(-)-α-amino-α-(4-hydroxyphenyl)acetate or an acid addition salt thereof with 7-amino-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid or a salt thereof in aqueous solution in the presence of enzyme derived from a microorganism selected from the group consisting of *Xanthomonas citri* (IFO 3835), *Acetobacter turbidans* (ATCC 9325) and *Pseudomonas melanogenum* (IFO 12020).

3,899,395

LIPOLYTIC ENZYME RECOVERY METHOD

Gerard J. Moskowitz, Buffalo Grove; John J. Como, Glenview, and Louis I. Feldman, Morton Grove, all of Ill., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed June 10, 1974, Ser. No. 477,889

Int. Cl. C07g *7/02*

U.S. Cl. 195—66 R **10 Claims**

1. The method of selectivity and substantially quantitatively recovering lipolytic enzyme from rennet from the fermentation growth product of Mucor species comprising adsorbing said fermentation growth product with material selected from the group consisting of diatomaceous earth and clay at pH of from about 4 to about 6 and then eluting the lipolytic enzyme from the adsorbent by adjusting the pH to a range of from about 9 to about 11.

3,899,396

ANTIBIOTIC ACTIVITIES FROM STREPTOSPORANGIUM VULGARE ATCC 21906

Carolina Coronelli; Maria Rosa Bardone, and Hermes Pagani, all of Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed May 24, 1974, Ser. No. 473,023

Claims priority, application United Kingdom, May 25, 1973, 25160/73

Int. Cl. C12d *9/00*

U.S. Cl. 195—80 R **3 Claims**

1. A process for producing antibiotic activity from *Streptosporangium vulgare var. antibioticum var. nov.* ATCC 21906 and separating it into the three active fractions named A, B and C which comprises cultivating said microorganism under submerged conditions in a liquid nutrient medium containing an assimilable source of carbon and nitrogen until a substantial antibiotic activity is present, recovering said antibiotic complex therefrom and separating it into the three active fractions A, B and C.

3,899,397

GLUTAMIC OXALACETIC TRANSMINASE ASSAY METHOD

Leo G. Morin, and Jerome R. Prox, both of Miami, Fla., assignors to Medico Electronic Inc., Indianapolis, Ind.

Filed July 5, 1973, Ser. No. 376,333

Int. Cl. C12k *1/04*; **C07g** *7/02*

U.S. Cl. 195—103.5 **9 Claims**

1. A method for determining the glutamic-oxalacetic transaminase in biological fluids which comprises: (a) preparing a substrate of l-aspartic acid, a-ketoglutaric acid and water, said substrate having a pH between about 5 and about 8; (b) admixing a sample of biological fluid and said substrate; (c) incubating admixture (b); (d) admixing a dipolar aprotic solvent and methanol with admixture (b) to stop the reaction between the l-aspartic acid and a-ketoglutaric acid which is catalyzed by the glutamic-oxalacetic transaminase; (e) admixing a diazonium dye with admixture (d); and (f) determining the activity level of the glutamic-oxalacetic transaminase by measuring the absorbance against a reagent-specimen blank.

3,899,398

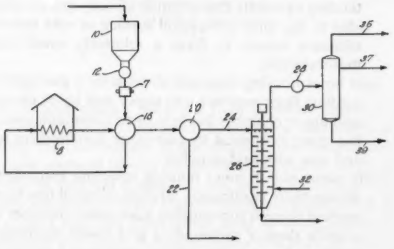
PROCESS FOR TREATING CITRUS WASTES TO OBTAIN WATER INSOLUBLE ESSENTIAL OILS

Edward L. Cole, Fishkill, and Howard V. Hess, Glenham, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 887,684, Dec. 23, 1969, abandoned, which is a continuation-in-part of Ser. No. 780,080, Nov. 29, 1968, Pat. No. 3,507,788. This application Nov. 24, 1972, Ser. No. 309,391

Int. Cl. C10b *53/00*

U.S. Cl. 201—2.5 **4 Claims**



1. Process for treating citrus wastes to obtain essential oils comprising coking said citrus wastes in the aqueous phase under autogeneous pressure at a temperature of about 350° to 750°F. in the absence of air or oxygen for a coking time rang-

ing from about 0.1 minute to about 2 hours under turbulent flow conditions characterized by a Reynolds number in excess of 2000, to form coke mixed with essential oils separating the coke so formed from the aqueous phase and heating said coke to distill off said essential oils.

3,899,399

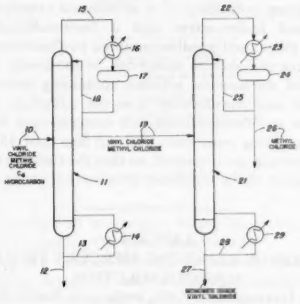
RECOVERY OF HIGH PURITY VINYL CHLORIDE BY DISTILLATION

Raymond H. Long, Morristown, and Harold Unger, Fort Lee, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Jan. 21, 1974, Ser. No. 435,100

Int. Cl.[2] B01D *3/00, 3/10*

U.S. Cl. 203—77 **5 Claims**



1. A process for recovering monomer grade vinyl chloride, comprising:

a. introducing a mixture comprising 95 to 99 mole % vinyl chloride and as impurities, methyl chloride and at least one C_4 aliphatic hydrocarbon into a first fractional distillation zone designed and operated to recover vinyl chloride and lighter components as overhead, containing less than 500 ppm of components boiling higher than vinyl chloride;

b. recovering the overhead from the first fractional distillation and introducing same into a second fractional distillation zone designed and operated to recover monomer grade vinyl chloride as bottoms; and

c. recovering a monomer grade vinyl chloride bottoms containing at least 99.95 mole % vinyl chloride from said second fractional distillation zone.

3,899,400

SURFACE TREATMENT OF ALUMINUM AND ITS ALLOYS

Jos Patrie, Grenoble; Jacques Lefebvre, and Francois Allegret, both of Voiron, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

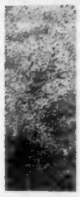
Filed July 9, 1974, Ser. No. 486,741

Claims priority, application France, July 13, 1973, 73.25800

Int. Cl.[2] C25D *5/44;* **C25F** *3/04*

U.S. Cl. 204—33 **8 Claims**

1. A method of decorating the surface of a piece of aluminum or aluminum alloy with a "lizardskin" appearance, which method comprises placing said piece as one electrode together with a second electrode in an aqueous electrolytic bath at about 5°–60°C and containing from about 0.1 to 20 grams/liter of hydrochloric acid, nitric acid, boric acid or fluoroboric acid and from about 0.1 to 20 grams/liter of a polyfluorinated sulfonate surfactant; and passing an alternating electrolytic



Example of a "lizardskin" appearance

current of 50–60 cycles between said electrodes at a potential from about 5 to 50 volts.

3,899,401

ELECTROCHEMICAL PRODUCTION OF PINACOLS

Heinz Nohe, Meckenheim, and Fritz Beck, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

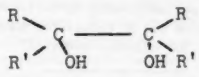
Filed Aug. 19, 1974, Ser. No. 498,447

Claims priority, application Germany, Aug. 25, 1973, 2343054

Int. Cl. C07b *29/06;* **C07c** *29/00, 31/20*

U.S. Cl. 204—59 R **3 Claims**

1. A process for the manufacture of pinacols of the formula



in which R is hydrogen or a hydrocarbon radical of one to six carbon atoms and R′ is a hydrocarbon radical of one to six carbon atoms, by electrolytic hydrodimerization of carbonyl compounds of the formula

R′—CO—R

in which R and R′ have the above meaning, in non-compartmented cells, wherein a mixture which contains from 5 to 75% by weight of the carbonyl compound, from 5 to 90% by weight of the alcohol corresponding to the carbonyl compound, of the formula

from 0.1 to 3% by weight of the quaternary ammonium salt and from 0 to 3% by weight of water is used for the electrolysis.

3,899,402

METHOD OF TAPPING ALUMINUM FROM A CELL FOR ELECTROLYTIC RECOVERY OF ALUMINUM

Kiranendu B. Chaudhuri, Gampel, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jan. 24, 1974, Ser. No. 436,161

Claims priority, application Switzerland, Aug. 9, 1973, 11498/73

Int. Cl. C22d *3/12, 3/02*

U.S. Cl. 204—67 **3 Claims**

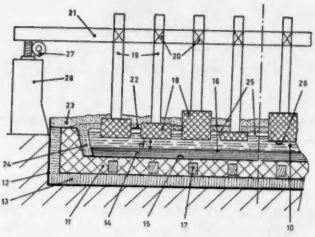
1. A method of tapping aluminum from a cell for recovery of aluminum by electrolysis of aluminum oxide dissolved in a fluoride melt, comprising the following operational steps:

a. at regular time intervals the instantaneous ohmic cell resistance is calculated, the instantaneous values over a certain period of time are smoothed and the difference

ΔR between this smoothed cell resistance and the base resistance established for each cell is calculated;

b. as soon as 30 to 60 minutes after a normal cell servicing, whenever the difference ΔR exceeds a limiting value given for each cell, the anode beam is raised or lowered, in order to match the existing ohmic resistance with the ohmic base resistance;

c. the difference ΔB of the vertical levels of the anode beam is calculated from two values, of which the first is taken 30 to 60 minutes after the normal cell service following



the previous tapping operation, and the second is taken 30 to 60 minutes after the last normal cell service before the next tapping operation referred to at (e) below;

d. the metal height H (mm) to be tapped is calculated according to the equation

$$H = J_m \cdot t \cdot f + \Delta B$$

in which J_m signifies the mean direct current in kiloamps, t the time in hours which has passed between successive tapping operations, and f a proportionality factor ($mm/kA \cdot h$)

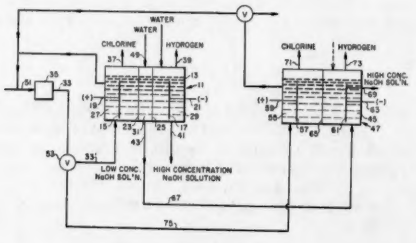
e. tapping is carried out to reduce the metal level by the height given by the equation under (*d*).

3,899,403

ELECTROLYTIC METHOD OF MAKING CONCENTRATED HYDROXIDE SOLUTIONS BY SEQUENTIAL USE OF 3-COMPARTMENT AND 2-COMPARTMENT ELECTROLYTIC CELLS HAVING SEPARATING COMPARTMENT WALLS OF PARTICULAR CATION-ACTIVE PERMSELECTIVE MEMBRANES

Edward H. Cook, Jr., Lewiston, and Alvin T. Emery, Youngstown, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Nov. 1, 1973, Ser. No. 411,619
Int. Cl. C01d *1/06*; C01b *7/06*
U.S. Cl. 204—98 **9 Claims**



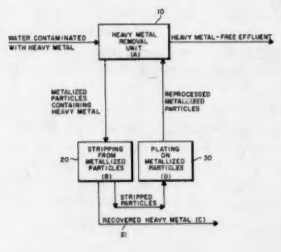
1. A method for electrolytically manufacturing a concentrated hydroxide solution containing over 250 but less than 450 g./l. of sodium hydroxide or equivalent hydroxide which comprises making concentrated and dilute aqueous hydroxide solutions simultaneously by electrolyzing an aqueous solution containing halide ions in an electrolytic cell having at least three compartments therein, an anode, a cathode, at least two cation-active permselective membranes of a polymeric material selected from the group consisting of a hydrolyzed copolymer of a perfluorinated hydrocarbon and a fluorosulfonated perfluorovinyl ether and a sulfostyrenated perfluorinated ethylene propylene polymer, defining anode and cathode side walls of a buffer compartment or compartments between anode and cathode compartments, and such walls, with walls thereabout, defining anode and cathode compartments, while adding water to the buffer compartment at such a rate as to produce a dilute hydroxide solution therein at the same time that a more concentrated hydroxide solution, containing over 250 but less than 450 g./l. of sodium hydroxide or equivalent is produced in the cathode compartment, while maintaining a high caustic efficiency, removing the dilute hydroxide from the buffer compartment and feeding it to the cathode compartment of a two-compartment electrolytic cell, having anode and cathode compartments separated by a cation-active permselective membrane of a polymeric material selected from the group consisting of a hydrolyzed copolymer of a perfluorinated hydrocarbon and a fluorosulfonated perfluorovinyl ether, and a sulfostyrenated perfluorinated ethylene propylene polymer, in which cell, in the anode compartment thereof, an aqueous solution containing halide ions is electrolyzed, and withdrawing from the catholyte compartment of the two-compartment cell concentrated hydroxide solution containing more than 250 but less than 450 g./l. of sodium hydroxide or equivalent, so that the cathode compartment efficiency of the combined processes is above 70%.

3,899,404

METHOD OF REMOVING MERCURY FROM AN AQUEOUS SOLUTION

Marlowe L. Iverson, Simi, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 240,058, March 31, 1972, abandoned. This application June 7, 1974, Ser. No. 477,530
Int. Cl.[2] B01K *3/00*, *3/04*; C02B *1/82*
U.S. Cl. 204—146 **11 Claims**


WATER CONTAMINATED WITH HEAVY METAL
HEAVY METAL REMOVAL UNIT (A)
HEAVY METAL-FREE EFFLUENT
METALLIZED PARTICLES CONTAINING HEAVY METAL
REPROCESSED METALLIZED PARTICLES
STRIPPING FROM METALLIZED PARTICLES (B)
PLATING ON METALLIZED PARTICLES (D)
STRIPPED PARTICLES
RECOVERED HEAVY METAL (C)

7. A method of removing mercury from an aqueous solution containing the same comprising passing an electrically conductive aqueous solution containing mercury through an electrochemical cell containing an anode and a cathode comprising a bed of particles having zinc surfaces,

contacting said particles with a cathodically polarized collector,

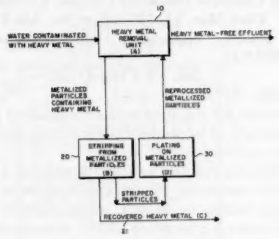
passing a direct current from said anode through said solution to said particles whereby the mercury is deposited upon and amalgamated with the zinc surfaces of said particles, discharging said solution of reduced mercury content, and

recovering said mercury by electrolytically stripping the zinc from the amalgam whereby the mercury forms droplets which coalesce and are recovered.

3,899,405
METHOD OF REMOVING HEAVY METALS FROM WATER AND APPARATUS THEREFOR

Marlowe L. Iverson, Simi, and Lowell R. McCoy, Woodland Hills, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 240,058, March 31, 1972. This application June 7, 1974, Ser. No. 477,531
Int. Cl.[2] B01K *3/00*, *3/02*; C02B *1/82*
U.S. Cl. 204—149 13 Claims



1. A method of removing a heavy metal from an aqueous solution containing the same comprising:

passing the solution through an electrochemical cell containing an anode and a cathode comprising a bed of particles having tin surfaces, contacting said particles with a cathodically polarized collector,

passing a direct current from said anode through the solution to said particles whereby heavy metal is removed from the solution and deposited on the tin surfaces of said particles and

discharging the aqueous solution of reduced heavy metal content.

3,899,406
ANTIOXIDANTS FOR ULTRAVIOLET CURABLE HIGH VINYL POLYBUTADIENES

Mark R. Roodvoets, Akron, Ohio, assignor to The Firestone Tire and Rubber Company, Akron, Ohio

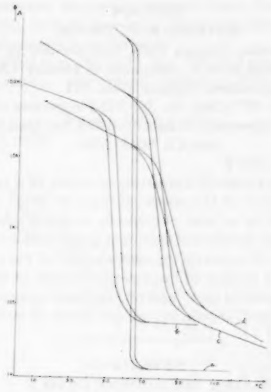
Filed Apr. 26, 1974, Ser. No. 464,591
Int. Cl.[2] C08C *19/00*; C08J *3/28*
U.S. Cl. 204—159.2 23 Claims

1. A process of producing antioxidized ultraviolet cured compositions comprising the steps of: adding by weight 100 parts of an ultraviolet curable resin; said resin containing about 40 parts to about 95 parts of a butadiene polymer or copolymer thereof with co-reactive monomers, said co-reactive monomers being vinyl monomers and ranging from about 5 parts to about 60 parts, said polybutadiene polymer being a homopolymer of butadiene or a copolymer of butadiene and styrene and containing at least 40% by weight of butadiene and at least 80% of the butadiene repeating units in the polymer or copolymer being in the 1,2-configuration, adding from 0.02 to about 0.4 parts of an antioxidant of a 2,2 methylene bis (4-R_1, 6-R_2-phenol) wherein R_1 is an aliphatic group having from 1 to 4 carbon atoms and R_2 is an aliphatic group having 3 or 4 carbon atoms, adding an antioxidant selected from the class consisting of (I) from 0.01 to about 0.5 parts of a dibutyl paracresol, and (II) from 0.005 to about 0.1 part of a N,N'-di(1-R_3, 1-R_4-methyl) p-phenylene diamine where R_3 is an aliphatic group having 1 to 4 carbon atoms and R_4 is an aliphatic group having 4 to 6 carbon atoms and III mixtures of (I) and (II), and then curing said curable resin having an improved cure rate with an ultraviolet source.

3,899,407
METHOD OF PRODUCING THIN FILM DEVICES OF DOPED VANADIUM OXIDE MATERIAL

H. Keith Eastwood, Beaconsfield, and Barry A. Noval, Cote St. Luc, both of Canada, assignors to Multi-State Devices Ltd., Quebec, Canada

Filed Aug. 1, 1973, Ser. No. 384,505
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 7 Claims

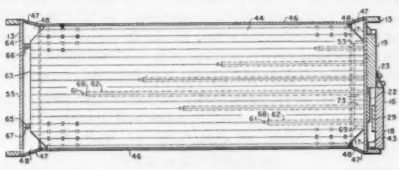


1. A method of producing thin film devices of vanadium oxide material having a desired transition temperature, consisting in reactively sputtering onto a suitable substrate a thin film consisting essentially of a vanadium oxide material having a transition temperature of fixed value and from 0.05 to 10 atomic percent of a single doping material selected from the group consisting of tungsten, molybdenum, titanium, niobium, germanium, silicon and carbon, permitting the increase or decrease in the transition temperature respectively above or below said fixed value.

3,899,408
CATHODE FINGER STRUCTURE FOR AN ELECTROLYTIC CELL

Leo G. Evans, Tonawanda, and Walter W. Ruthel, Grand Island, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jan. 3, 1974, Ser. No. 430,430
Int. Cl. B01k *3/04*
U.S. Cl. 204—286 6 Claims



1. A cathode finger, suitable for use in an electrolytic cell, wherein said cathode finger has a cathode finger structure which comprises a corrugated conductive metal reinforcing means, lengths of highly conductive metal positioned in the cathode finger structure, and foraminous conductive metal means attached to said cathode finger reinforcing means thereby forming the exterior of the cathode finger structure and providing a gas compartment space inside the cathode finger structure, said corrugated conductive metal structure

having protrusions positioned on the outer surfaces of its ridges to which said foraninous conductive metal means is attached to provide additional compartment space for gas, said lengths of highly conductive metal are positioned in the cathode finger structure in such a configuration wherein the lengths of highly conductive metal are adapted to carry an electric current and to maintain a substantially uniform current density through the cathode finger without any significant voltage drop across the cathode finger and with the most economical power consumption in the cathode finger.

3,899,409

BIPOLAR ELECTRODE

Robert F. Schultz, Niagara Falls, and Edward H. Cook, Jr., Lewiston, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed May 25, 1973, Ser. No. 363,926The portion of the term of this patent subsequent to July 30, 1991, has been disclaimed.

Int. Cl. B01k *3/04*

U.S. Cl. 204—290 F **10 Claims**

1. A bipolar electrode consisting of a core of a valve metal, at least a portion of the anodic surface of which is conductively covered by at least one anodic material selected from platinum group metals and platinum group metal oxides, and a barrier layer of boron on the cathodic side of the valve metal core, at least a portion of the exterior surface of the layer of boron being covered by at least one cathodic material selected from iron, copper, cobalt, nickel and alloys of these.

3,899,410

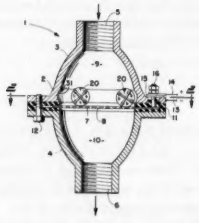
WATER TREATMENT DEVICE

Henry S. Aber, Cleveland; Dean D. Riggs, Avon Lake, and John Lamantia, Lakewood, all of Ohio, assignors to Water Technology Service, Inc., Cleveland, Ohio

Filed May 2, 1973, Ser. No. 356,600

Int. Cl. B03c *5/02, 5/00*

U.S. Cl. 204—302 **18 Claims**



1. In a liquid treatment device for connection to a liquid flow line including a fitting having a flow path therethrough and divided into separate chambers by at least one electrically conductive perforated screen supported in electrically insulated relation within said fitting in said flow path, the improvement comprising means positioned in said fitting for removing automatically and continuously accumulated deposits from said perforated screen as liquid flows therethrough.

3,899,411

OCTANE CRACKING

John C. Bonacci, Cherry Hill, and William P. Burgess, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 8, 1974, Ser. No. 431,642

Int. Cl. C10g *39/00, 35/08*

U.S. Cl. 208—66 **7 Claims**

1. In the method of upgrading the octane number of a naphtha boiling range hydrocarbon fraction by the sequence of reforming using a platinum type reforming catalyst followed by shape selective conversion of the reformate using a shape selective crystalline aluminosilicate zeolite catalyst having a pore size of 4.5 to 6.0 A. such as to admit only molecules having an effective diameter up to that of normal paraffins; the improvement which comprises utilizing in said shape selective conversion step a catalyst which is a mixture of said shape selective zeolite and about 20 to 50 weight percent of a platinum type reforming catalyst.

3,899,412

AROMATICS EXTRACTION PROCESS

Frederick Rowe; Michael George Norton, and John Anthony Fairweather, all of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 13, 1973, Ser. No. 340,923

Claims priority, application United Kingdom, Mar. 13, 1972, 11593/72

Int. Cl. C10g *37/08*

U.S. Cl. 208—92 **10 Claims**

1. A process for the treatment of a cracked gasoline prior to the recovery of aromatic hydrocarbons therefrom which includes in combination the steps,

a. distilling the cracked gasoline to recover a first distillate fraction containing all the components in said cracked gasoline boiling up to 80°C at atmospheric pressure and a first residue containing all the components which boil above 80°C,

b. heating said residue which boils above 80°C from distillation step (a) in the liquid phase at a temperature in the range 200° to 350°C to form a substantial amount of material boiling above the end point of said residue,

c. distilling the heated residue from step (*b*) to separate a second distillate fraction boiling up to 250°C at atmospheric pressure, and a second residue containing said material boiling above the end point of the first residue, and

d. hydrogenating said second distillate fraction.

3,899,413

PLATINUM-GERMANIUM-GOLD REFORMING CATALYST AND PROCESS

John W. Myers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 17, 1973, Ser. No. 361,243

Int. Cl. C10g *35/06;* **B01j** *11/74, 11/08*

U.S. Cl. 208—138 **9 Claims**

1. The process for the catalytic reforming of hydrocarbons which comprises contacting a naphtha and hydrogen with a catalyst having increased activity and selectivity consisting essentially of a refractory support promoted with platinum, germanium and gold in an amount for each promoter ranging from 0.05 to 2 weight percent at reforming conditions and withdrawing a reformate of improved octane rating.

7. A reforming catalyst composition consisting essentially of:

a. 0.05–1 weight percent platinum,

b. 0.05–1 weight percent germanium, and

c. 0.05–1 weight percent gold, incorporated into

d. a refractory support.

3,899,414

DRILLING MUD SEPARATION SYSTEM

Leslie T. Hansen, Lakewood, Calif., assignor to Sweco, Inc., Los Angeles, Calif.

Filed Mar. 16, 1973, Ser. No. 341,942

Int. Cl. B04c *9/00*

U.S. Cl. 209—17 **3 Claims**

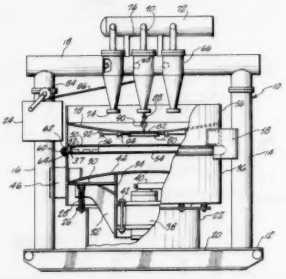
1. A separation system for separating drilled solids from drilling mud comprising

a frame;

an influent manifold fixed to said frame for receiving drilled solids-containing influent;

a plurality of hydrocyclones coupled to said manifold for receiving influent therefrom and separating that influent into a sediment which is exhausted downward from said plurality of hydrocyclones and a cleaned drilling mud effluent directed upward from said plurality of hydrocyclones;

a vibratory screen separator mounted on said frame below said hydrocyclones, said vibratory separator including a base, fixed to said frame, a housing resiliently mounted on said base, driving means for vibrating said separator, screen means for separating the sediment into a screened effluent of chemical additives and a concentrate of drilled



solids, a sediment receiver comprising an arcuate plate mounted to said housing directly below said plurality of hydrocyclones and above said screen means for receiving the sediment from said hydrocyclones and directing it to a central position on said receiver, receiver outlet means for directing the sediment from the central position on said receiver to a central position on said screen means, said receiver outlet means including a passageway through said sediment receiver at the central position on said receiver and a grate means positioned within said passageway for preventing the passage of large objects through said passageway.

3,899,415

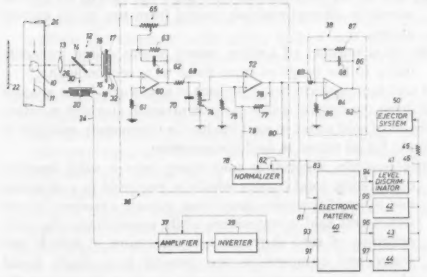
SORTING MACHINE WITH DIGITAL ERROR CORRECTION

Elias H. Codding, and Hoyd S. King, Jr., both of Houston, Tex., assignors to Petty-Ray Geophysical, Inc., Houston, Tex.

Filed Mar. 29, 1974, Ser. No. 456,257

Int. Cl.[2] B07C *5/342*

U.S. Cl. 209—111.6 **8 Claims**



6. In a light-sensitive sorting machine having direct coupled amplifier means for amplifying electrical signals indicative of a light reflective property of an article to be sorted, the improvement comprising normalizing means operatively coupled to said amplifier means for introducing an error correction thereto, said normalizing means including means for setting said error correction in digital counter means, digital-to-analog converter means operatively coupled to said digital counter means for introducing said error correction to said amplifier means in analog format and means for redetermining the value of said error correction at selected intervals and resetting said predetermined error correction in said normalizing means.

3,899,416

SORTING DEVICE SEPARATING A POWDER MIXTURE INTO SPHEROIDAL AND SHARP-EDGED PARTICLES

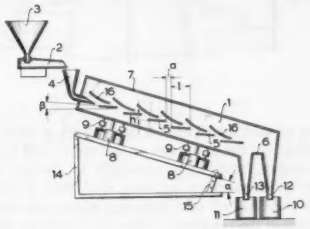
Günther Schwartz, Hurth-Gleuel, and Klaus Frank, Hurth-Hermulheim, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Oct. 29, 1973, Ser. No. 410,686

Claims priority, application Germany, Oct. 31, 1972, 2253353

Int. Cl. B07b *13/10*

U.S. Cl. 209—118 **11 Claims**



1. A sorting device for separating a powder into spheroidal particles and sharp-edged particles, wherein a plurality of separating cascade members are spaced apart, are disposed at successively lower levels and are inclined with respect to the horizontal so as to form an inclined cascade-sorting tunnel, and are secured to the side walls of an elongated container having an inlet disposed at its upper end and outlets disposed at its lower end; the sorting device comprising braking aprons secured above the separating-cascade members to form part of the sorting tunnel; a separation plate being positioned near the lower end of the elongated container; receiving means collecting spheroidal particles and sharp-edged particles, respectively, the receiving means being placed below the lower end of said container on both sides of the separation plate; a vibrating chute positioned above the upper end of the cascade-sorting tunnel; a frame supporting the container, the frame providing a downwardly inclined supporting plane having an angle α with α respect to the horizontal; a plurality of vibrators and shock absorbers being interposed between the container and the frame, and the braking aprons being disposed over the spaces between the cascade members.

3,899,417

IN-LINE PRESSURE SIFTER

Gilbert C. Morris, Columbus, Ohio, assignor to The Fred D. Pfening Company, Columbus, Ohio

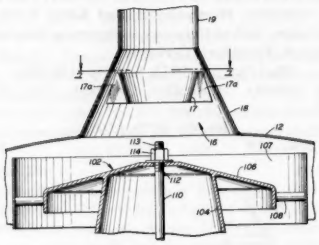
Filed Sept. 19, 1973, Ser. No. 398,676

Int. Cl.[2] B07B *1/46*

U.S. Cl. 209—243 **1 Claim**

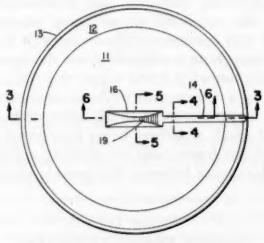
1. In a gyratory pressure sifter which includes a generally vertically arranged housing having an upper end closure provided with an inlet for air-entrained solid particles to be sifted and a lower end closure having a primary outlet for the discharge of air-entrained, sifted fines and a secondary outlet for the gravitational discharge of unsifted, larger size solid particles from said housing, and a plurality of generally horizontally arranged, vertically spaced apart sieve assemblies positioned in said housing between said upper and lower end

closures; that improvement which comrises: an upwardly tapering frusto-conical inlet conduit having a wider lower end connected with the upper end closure of said housing and defining a downwardly and outwardly flaring inlet passage into said housing; and a downwardly tapering funnel-shaped separator ring positioned intermediate the ends of said inlet conduit and in coaxial, inwardly spaced relation thereto, said separator ring being spaced downwardly from the upper end



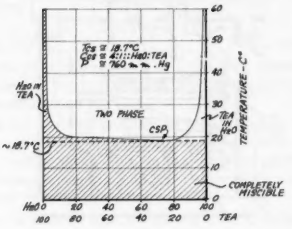
opening of said inlet conduit and having a mouth opening of approximately the same size as the upper end opening of said inlet conduit, and being arranged to funnel the relatively heavier solid particles entering said inlet conduit inwardly toward the axis of said housing while permitting outward expansion of the relatively lighter air stream as it passes downwardly through said inlet conduit to thereby effect a partial separation of solid particles from the incoming air stream.

3,899,418
MINER'S PAN
Manuel P. Lawrence, 633 Highland St., and Kenneth F. Jacobson, P.O. Box 1764, both of Carson City, Nev. 89701
Filed Sept. 24, 1973, Ser. No. 400,411
Int. Cl.[2] B03B *3/00*
U.S. Cl. 209—447 **5 Claims**



5. A device for separating heavy precious metals from a placer material, comprising a pan having a generally circular bottom and an upwardly and outwardly extending side wall, a groove extending radially in said bottom and extending substantially to the lip of said side wall for hastening the separation of said precious metals from said placer materials, an upwardly opening trap formed centrally in said bottom and communicating with said groove, said trap comprising a depression in said bottom, said depression having two longitudinal sides depending in a V relationship from said bottom and joined by an arcuate trap bottom.

3,899,419
METHOD FOR CHEMICAL FRACTIONATION, DEFATTING AND DEWATERING OF SOLIDS AND SUSPENSIONS
Carl F. Emanuel, Bellevue, Wash., assignor to Resources Conservation Co., Renton, Wash.
Continuation of Ser. No. 288,872, Sept. 13, 1972, abandoned.
This application June 21, 1974, Ser. No. 481,757
Int. Cl.[2] B01D *11/00*
U.S. Cl. 210—22 **47 Claims**



1. A method for removing water from a mixture comprising water and particulate solid matter which is insoluble in water comprising:

contacting said mixture with a liquid composition to form a slurry, said composition having an inverse critical solution temperature in a two phase system with water and being selected from a member of or mixtures of members of the groups of amines having the formula

$$\begin{array}{l} R_1 \\ | \\ N-R_2 \\ | \\ R_3 \end{array}$$

wherein

R_1 is a hydrogen or an alkyl radical, and

R_2 and R_3 are alkyl radicals having from one to six carbon atoms or alkenyl radicals having from two to six carbon atoms,

the total number of carbon atoms in the amine molecule being in the range of from three to seven, inclusive,

and said composition being present in said slurry in an amount of at least the critical solution concentration at which substantially all of said water in said mixture is completely miscible in a single liquid phase in said composition,

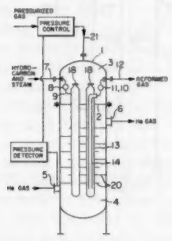
mechanically separating said slurry into a solid fraction comprising solid matter which is insoluble in said slurry and a liquid fraction comprising at least a portion of said water and said composition while maintaining the temperature of said slurry at a temperature at which said water and composition are present in a single liquid phase, after separating said solid fraction, increasing the temperature of said liquid fraction to a temperature above said inverse critical solution to form two liquid phases comprising a composition phase containing a small amount of water and a water phase containing a small amount of composition, and

thereafter mechanically separating said water phase from said composition phase.

3,899,420
STEAM REFORMER FOR HYDROCARBONS

Masao Nozawa; Takehiko Yasuno; Takashi Yamaguchi, Tokyo, and Hiroshi Uenoyama, Yokohama, all of Japan, assignors to Japan Atomic Energy Research Institute and Japan Gasoline Co., Ltd., both of Tokyo, Japan

Filed Mar. 24, 1972, Ser. No. 237,865
Claims priority, application Japan, Mar. 27, 1971, 46-18136
Int. Cl. C12k 1/10
U.S. Cl. 196—129 6 Claims



1. An apparatus for the steam reforming of hydrocarbons, comprising:

an upright hollow casing having a tube sheet extending across the interior of said casing between the upper and lower ends thereof and dividing said casing into an upper closed pressure vessel and a lower closed pressure vessel, said vessels being isolated from each other and connected in gas-tight relationship;

a plurality of vertical reforming tube structures supported on said tube sheet and extending therethrough in gas-tight relationship therewith, said tube sheet being imperforate except where said reforming tube structures extend therethrough, said reforming tube structures each having an upper portion extending upwardly into said upper pressure vessel and a lower portion extending downwardly into said lower pressure vessel, each of said reforming tube structures comprising substantially concentric and spaced-apart inner and outer tubes which tubes are in gas flow communication with each other only at the lower end of said inner tube, and containing a bed of steam reforming catalyst packed in the space between said inner and outer tubes with the lower end of said bed being spaced upwardly from the lower end of said inner tube; first conduit means in said upper pressure vessel and connected to the upper end of the outer tube of each reforming tube structure for feeding a mixture of hydrocarbon and steam into the upper end of said outer tube, said outer tube being closed except for said first conduit means;

second conduit means in said upper pressure vessel connected to the upper end of the inner tube of each reforming tube structure for discharging from the upper end of said inner tube and thence outwardly from the casing the reformed gas produced by flowing said mixture through said catalyst, said inner tube being closed except for said second conduit means and the communication of the lower end of said inner tube with said outer tube;

means adjacent the lower end of said lower pressure vessel for flowing into said lower vessel a stream of helium gas having a temperature of from about 750° to about 1100°C and a pressure of from about 20 to about 60 kg/cm² and directing same against the lower ends of said reforming tube structures;

baffle means in said lower pressure vessel and associated with the exterior of said reforming tube structures and extending from adjacent the lower ends to adjacent the upper ends of the lower portions of said reforming tube structures for guiding flow of said helium gas upwardly around said reforming tube structures so that said helium gas is effective to heat the contents of said reforming tube structures to the reforming temperature;

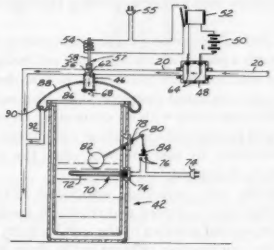
means adjacent the upper end of said lower pressure vessel for discharging said helium gas from said lower pressure vessel;

and means for supplying a further pressurized gas into said upper pressure vessel to maintain in said upper vessel a pressure substantially equal to the helium gas pressure in said lower pressure vessel.

3,899,421
SALT RECOVERY SYSTEM

Bertram Keilin, 9711 La Capilla Ave., Fountain Valley, Calif. 92708, and Joseph M. Hebert, 336 N. Main St., Salinas, Calif. 93901

Filed Nov. 9, 1973, Ser. No. 414,400
Int. Cl. B01d 15/06
U.S. Cl. 210—96 6 Claims



1. In an automatic water softener comprising a mineral tank adapted to hold a quantity of water softening ion exchange material, a brine tank adapted to hold a supply of brine, flow control means, a drain line, and plumbing means interconnecting the mineral tank, brine tank and flow control means with a source of tap water, a service line for receiving softened water from the water softener, and said drain line, said flow control means being a flow control module;

said flow control module including associated valve and first valve control means for effectuating at least the following sequence of flow steps, in the order given: a service step in which hard tap water is passed through water softening ion exchange material in the mineral tank in a first direction to soften the water, the softened water then being passed into said service line; a backwash step in which new tap water is passed through the ion exchange material in the mineral tank in a second direction, opposite to the first, and then directed, as a substantially salt-free effluent, into said drain line; a brining step in which brine from the brine tank is passed through said ion exchange material for regeneration purposes, then, as a relatively high saline content effluent, into said drain line; and a rinse step in which fresh tap water is passed through said ion exchange material to rinse residual brine therefrom, and then into the drain line as a relatively low saline content effluent;

the saline recovery means comprising:

container means adapted to hold a quantity of liquid;

conduit means connecting said container means with said drain line;

valve means associated with said conduit means, said valve means being adjustable between an open position in which it permits the flow of liquid from said drain line through said conduit means and into said container means by gravity, and a closed position in which it blocks the flow of liquid through the conduit means into the

container means, said valve means being in normally closed position; and

second valve control means for opening said valve means at the approximate time the brining step effluent reaches said valve means and holding the valve means open until approximately all of this effluent flows into said conduit means, then causing said valve means to close, said second valve control means including sensing and valve opening means for sensing when the saline content of the effluent liquid in said drain line is relatively high, as in said brining step effluent, and then opening said valve means, holding it open for as long as the effluent remains relatively high in saline content, and, when the saline content in the effluent drops to the low level of the saline content of the rinse step effluent, causing said valve means to return to its normally closed position; whereby said valve means remains closed at all times except when the relatively high saline content effluent from said brining step reaches it, at which time it opens and remains open long enough to permit the flow of the effluent into said container means then closes again, to thereby effectuate selective recovery of the brining step effluent from the various flow step effluents passing through said drain line;

said sensing and valve opening means comprising a conductivity cell with a pair of electrodes, said cell being situated so that the electrodes are positioned in said drain line, a solenoid, and associated circuitry; said valve means comprising a diverter valve with an obturating element characterized and positioned for vertical movement, for valve opening purposes, by said solenoid when the solenoid is appropriately energized;

the conductivity cell, solenoid, associated circuitry and diverter valve being adapted and relatively positioned for cooperation so that contact of the conductivity cell electrodes by the brining step effluent in the drain line causes current flow therebetween because of the saline content of this effluent and the resulting current flow causes energization of said solenoid and consequent vertical movement of said obturating element of the diverter valve to its valve-open position, whereby the brining step effluent flows through the open valve and into said container means;

said current flow between said electrodes ceasing when the brining step effluent ceases to contact them so that said solenoid is deenergized to return said obturating element to its normal, valve-closed position and thereby shut off the continued flow of liquid from the drain line through said diverter valve.

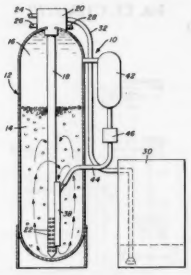
3,899,422

RECIRCULATING RESIN CLEANING CHEMICAL FEEDER SYSTEM FOR WATER SOFTENERS

James L. Williams, 11782 Bonnie Brae Dr., S.W., Massillon, Ohio 44646

Filed Apr. 24, 1974, Ser. No. 463,587
Int. Cl.[2] B01D *29/38*
U.S. Cl. 210—108 **2 Claims**

1. In liquid treatment apparatus comprising a tank having a bed of particulate filter material therein, an elongated liquid carrying service tube extending into the bed, a backwash system for the particulate filter material comprising an elongated cleaning tube within the bed, said cleaning tube being affixed to and extending along a portion of said service tube, the cleaning tube having an open intake end and an open discharge end, means for introducing a forced flow of backwash liquid diagonally across said cleaning tube inward of the intake end thereof and angled toward the open discharge end to induce circulation of filter particles through the cleaning tube and the diagonally directed flow, said means for introducing a forced flow of backwash liquid comprising a port in the service tube between the service tube and the cleaning tube inward of the intake end for the selective directing of a liquid flow from the service tube into the cleaning tube, and valve means normally closing said port and operatively openable in response to an internal pressure buildup in said service tube, said valve means, upon an opening thereof, being configured to direct flow diagonally across the cleaning tube substantially coextensive with the cross-section of the cleaning tube, said valve means comprising a flap valve overlying the



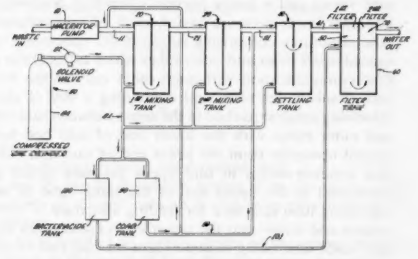
port within the cleaning tube, said cleaning tube being generally arcuate in cross-section outward of the service tube, said flap valve being generally arcuate and secured along one arcuate end thereof to the service tube for a selective opening movement of the second arcuate end thereof into the cleaning tube and an arcuate dispersion of the liquid flow from the port.

3,899,423

SEWAGE TREATMENT SYSTEM

Thomas F. McGrath, Simi, Calif., assignor to Lee, Meyer & Associates, Inc., Westlake Village, Calif.

Filed Jan. 13, 1972, Ser. No. 217,586
Int. Cl.[2] B01D *23/14*; **C02B** *3/08*
U.S. Cl. 210—152 **7 Claims**



1. A portable, small volume sewage processing system adapted for use in watercraft, mobile equipment and where sewage treatment facilities are not available comprising, in combination;

means for receiving, macerating and delivering sewage to a mixing tank;

at least one mixing tank disposed and connected to receive macerated sewage which includes opposing generally vertical walls, said walls having a plurality of downwardly sloping vanes extending therefrom at a predetermined angle with respect to the vertical in alternating disposition such that material falling from one vane impinges upon an alternate lower vane extending from an opposing wall;

at least one settling tank disposed and connected to receive sewage from the mixing tank for permitting the separation of solid sewage components from liquid sewage components, the settling tank including opposed upright walls having a plurality of downwardly sloping vanes

extending therefrom at a predetermined angle with respect to vertical in alternation disposition such that material falling from one vane impinges upon a lower alternate vane extending from the opposing wall, with solid material falling from the bottom of such vanes and being collected in the bottom of the settling tank for periodic removal;

a filter tank connected for receiving clarified sewage from the settling tank the filter tank including an input filter through which the clarified sewage flows into the filter tank and an output filter through which clarified and disinfected sewage flows from the filter tank;

means for injecting coagulent into the sewage in the mixing tank and in the settling tank;

means for injecting oxygen into the mixing and settling tanks at a point below the alternating vanes therein; and means for injecting bactericide into the filter tank;

the output filter in said tank being so composed and constructed as to absorb bactericide thus providing a large surface contact area between the bactericide and the sewage and a reservoir of bactericide in the filter tank;

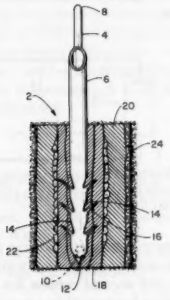
the vanes in the mixing tank being so spaced and angularly disposed as to cause turbulent flow at the point of which the sewage flow turns to direct heavy solid particles to the bottom of the tank for bacterial digestion, to direct a cloud of floculated sewage to the bottom of the tank, and to form pockets of oxygen beneath said vanes to provide constant contact between oxygen and the sewage under treatment.

3,899,424

DISPOSABLE AQUARIUM FILTER

John K. Lake, Van Nuys, Calif., assignor to John P. Graff, Jr., Pasadena, Calif., a part interest

Filed Dec. 3, 1973, Ser. No. 420,916
Int. Cl. E04h *3/20*
U.S. Cl. 210—169 **8 Claims**



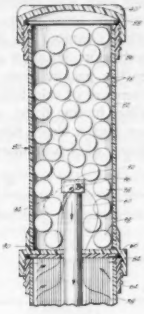
1. A disposable aquarium filter comprising the combination of: a first tube adapted to be connected to an air supply source; a second tube of larger diameter than said first tube, the lower ends of said first and second tube being about coterminus, the lower portions of said second tube having fluid passageways therethrough; a first continuous layer of filter material wound about and encircling the lower portions of said first and second tubes; a second continuous layer of filter material wound about and encircling said first layer of filter material and said tubes; granules of a chemical purifier at the interface between said first and second layers of filter materials; and an outer continuous layer of open mesh material wound about and encircling said second layer of filter material, said fluid passageways being formed by extending, displaced tube wall portions of said second tube which protrude into said first continuous layer of filter material to form a mechanical connection therebetween.

3,899,425

MODULAR FILTER AND AUTOMATIC CHLORINATOR FOR SWIMMING POOLS

Kenneth Lewis, South Gate, Calif., assignor to H.S.M. Americas Ltd., Signal Hill, Calif.

Continuation-in-part of Ser. No. 284,237, Aug. 28, 1972, abandoned. This application Apr. 5, 1974, Ser. No. 458,091
Int. Cl. E04h *3/16*
U.S. Cl. 210—206 **3 Claims**



1. A combined pool filter and chlorinating unit using chlorine pellets comprising:

a fluid-tight housing having an intermediate wall dividing the housing into an upper chamber and a lower chamber, the wall having a central opening therein,

means admitting pool water into the lower chamber of the housing adjacent the sides thereof,

a central outlet tube extending vertically upwardly from the bottom of the housing through the opening in the intermediate wall into the upper chamber, the tube having a diameter smaller than the central opening in the intermediate wall,

a removable annular filter element in the lower chamber extending around the tube in spaced relation to the tube and to the chamber walls,

means providing a seal between the lower end of the filter element and the outlet tube adjacent the bottom of the lower chamber,

means providing a seal between the upper end of the filter element and the intermediate wall, whereby pool water admitted to the lower chamber must pass radially inwardly through the filter to reach the outlet tube, the tube having a restricted opening into the tube adjacent the upper end above the intermediate wall for controlling the rate of flow of water through the upper chamber, whereby water passing through the filter rises along the exterior of the tube into the upper chamber to enter the tube, soluble chlorine pellets in the upper chamber supported by the intermediate wall, and air-tight removable means providing access to the upper chamber for loading the pellets in the chamber.

3,899,426

APPARATUS AND METHOD FOR FILTER SEAL

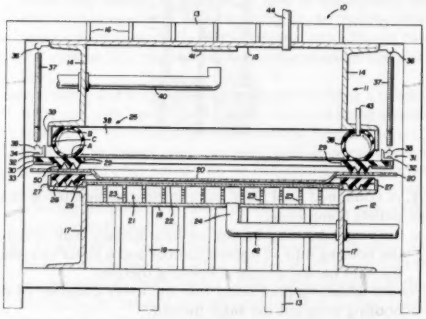
Gene Hirs, Birmingham, Mich., assignor to Hydromation Filter Company, Livonia, Mich.

Filed May 20, 1974, Ser. No. 471,520
Int. Cl. B01d *33/02*
U.S. Cl. 210—387 **6 Claims**

1. In a pressure filter having a filter medium interposed, between fixed, vertically spaced upper and lower chambers, the improvement of sealing means normally sealing the chambers to one another, said sealing means including a support ledge surface encircling one of the chambers and engaging the

filter medium, a gasket peripherally encircling the other chamber and being vertically aligned with the support ledge for contacting the filter medium, means constantly biasing said gasket vertically away from the ledge surface, a radially distensible tube vertically interposed between said gasket and the other said chamber, said tube being vertically aligned with said gasket for sealing said other chamber around its entire periphery, and means for injecting fluid under pressure into said tube to radially distend the tube and (a) to displace the gasket into sealing engagement with the filter medium and the ledge, (b) to urge the tube into sealing engagement with the gasket, (c) to increase the tension on said biasing means, and (d) to close said other chamber for filtration flow, wherein said tube is collapsed upon deflation and said biasing means thereupon displaces the gasket from said support ledge to accommodate the removal of said filter medium.

4. In a pressure filter having fixed, vertically spaced upper and lower chambers and a sheet filter medium interposed between the chambers, each chamber having an encircling



sealing surface and said sealing surfaces being spaced and vertically aligned, wherein contaminated liquid enters one of said chambers under pressure, flows through said sheet filter medium for the removal of particulate contaminants, and exits through the other chamber, the improvement of a vertically displaceable sealing gasket interposed between said filter medium and the sealing surface of one of said chambers, a separate inflatable tube interposed between and unattached to the sealing gasket and the sealing surface of said one chamber, means for injecting fluid under pressure into said tube to radially distend the tube and (a) displace the gasket into sealing engagement with the filter medium and the sealing surface of the other chamber, (b) to urge the tube into sealing engagement with the gasket, and (c) to urge the tube into sealing engagement with the sealing surface the of said one chamber, and constantly acting means for displacing the gasket away from the sealing surface of the other chamber upon collapse of the tube by deflation, to accomodate the removal of said filter medium.

3,899,427

DEVICE FOR SEPARATING PARTICLES FROM A FLUID STREAM

Thomas Macfarlane Connelly, Eaglesham; Ian George Rowe, and Douglas Stewart Morrison, both of Edinburgh, all of Scotland, assignors to Begg Cousland & Co. Ltd., Glascow, Scotland

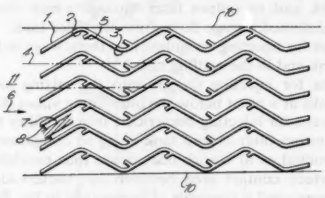
Filed June 7, 1973, Ser. No. 367,809

Claims priority, application United Kingdom, June 10, 1972, 27213/72

Int. Cl.[2] B01D *21/00*

U.S. Cl. 210—521 **8 Claims**

1. In a device for separating particles from a fluid stream, comprising casing means defining a fluid stream path between an inlet and an outlet, a plurality of plates located in said casing means in the path of the fluid stream, said plates being formed with troughs and crests and arranged in at least one group constituting a separating unit and oriented such that lines joining the crests and lines joining the troughs of each plate extend in a direction generally parallel to the fluid stream path defined by the casing and such that the crests of each plate face the troughs of each adjacent plate, the axes of the troughs extending transversely of said fluid stream path, said plates defining a plurality of passages between pairs of adjacent plates, said passages being of zig-zag configuration with alternate crests and troughs defined by the crests and



troughs of the plates, the improvement comprising upstanding vanes attached to the plates, one vane attached in the bottom half of each trough of its attached plate on the downstream side of the trough with respect to the direction of fluid flow between the plates and orientated to project outwardly from the trough bottom and to lean in the direction towards the upstream side of the same trough, each said vane extending along its trough for substantially the full width of the passage defined by its attached plate and an adjacent plate.

3,899,428

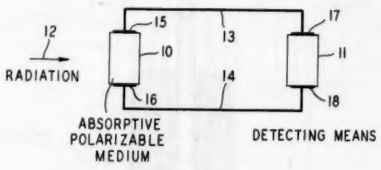
MILLIMETER WAVE DEVICES UTILIZING ELECTRICALLY POLARIZED MEDIA

David Henry Auston, Mountainside, and Alastair Malcolm Glass, Millington, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 7, 1972, Ser. No. 232,407

Int. Cl. H01l *15/00*

U.S. Cl. 250—199 **20 Claims**



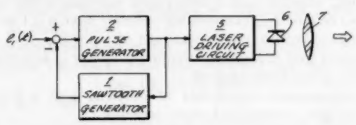
1. Apparatus comprising a transducer for altering incoming electromagnetic radiation provided with first means for receiving radiation and second means for emitting the altered energy, said radiation being within a range having a maximum wavelength of 10 micrometers and manifesting a variation in input radiation intensity on a time scale corresponding with a cycle time of up to about 10 terahertz, said transducer being so adapted as to emit an electrical signal having an electric field variation corresponding to the said variation, characterized in that said transducer consists essentially of a body which is capable of manifesting electrical polarization on a macroscale and containing an absorbing species having a maximum absorption length for the said radiation of about 0.2cm, substantially the entirety of the absorption responsible for the said absorption length being due to a change in electronic configuration from a ground state to an excited state within the said absorbing species, the said absorbing species having a dipole moment in the ground state of at least 0.01 Debye when the environment of the absorbing species within the said body is polar, whereby electronic excitation results in an electrical impulse with the net electrical signal representing net effect of the totality of such impulses responsive to the said variation of

incoming electromagnetic radiation said second means including means for coupling said electrical signal to utilization means.

3,899,429
PULSE-FREQUENCY-MODULATION SIGNAL TRANSMISSION SYSTEM

Yoshito Ueno; Mitsuo Kajitani, and Yoshio Ohgushi, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Oct. 24, 1972, Ser. No. 300,179
Claims priority, application Japan, Oct. 29, 1971, 46-86418
Int. Cl.[2] H04B *9/00*; **H04L** *25/00*
U.S. Cl. 250—199 **3 Claims**



1. A pulse-frequency-modulation system for transmitting and receiving analog signals and the like wherein the magnitude of the sampled analog signal is represented by the time spacing between successively transmitted narrow pulses, said system comprising:

a sawtooth generator;

circuit means for comparing the analog signal to be transmitted with the output of said sawtooth generator;

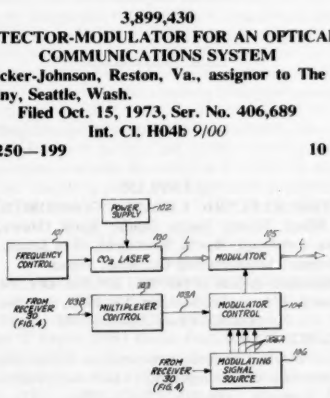
pulse generating means coupled to said comparison circuit for generating a narrow pulse when the level difference of the two inputs to the comparison circuit have a predetermined relationship;

the input of said sawtooth generator being coupled to the output of said pulse generator which is adapted to instantaneously reset the ramp signal of said sawtooth generator to zero level by said narrow pulse and thereby instantaneously initiating a successive ramp signal after said resetting operation to enable said circuit means to perform a subsequent comparison operation, whereby adjacent narrow pulses are time-spaced relative to one another as a function of the instantaneous level of the analog input signal to be transmitted.

3,899,430
DETECTOR-MODULATOR FOR AN OPTICAL COMMUNICATIONS SYSTEM

Betsy Ancker-Johnson, Reston, Va., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 15, 1973, Ser. No. 406,689
Int. Cl. H04b *9/00*
U.S. Cl. 250—199 **10 Claims**



1. A detector-modulator for an optical communications system comprising:

a. a narrow energy-gap semiconductor means capable of producing an electron-hole plasma by multiphoton absorption in response to irradiation by a modulated coherent optical carrier having a predetermined wavelength;

b. a biasing circuit means connected to said semiconductor means resulting from said plasma to provide an output signal proportional to the modulation of said coherent optical carrier; and,

c. a modulating voltage means connected to said semiconductor means to apply a modulating voltage across said semiconductor means in response to a modulating signal to accordingly create a second plasma in said semiconductor means which modulates said coherent optical carrier by free-hole absorption thereof.

6. An optical communications system comprising:

a. a first transceiver means including a source of a modulated coherent optical carrier having a predetermined wavelength; and

b. a second transceiver means including a narrow energy-gap semiconductor means capable of producing an electron-hole plasma by multiphoton absorption in response to irradiation by said coherent optical carrier and a biasing circuit means for detecting excess conductivity in said semiconductor means resulting from said plasma to provide an output signal in proportion to the modulation of said carrier.

3,899,431
OIL-IN-WATER MICROEMULSION DRILLING FLUIDS

John B. Hayes, Littleton; Gerald W. Haws, Denver, and William B. Gogarty, Littleton, all of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Jan. 18, 1973, Ser. No. 324,710
Int. Cl. E21b *21/04*
U.S. Cl. 252—8.5 P **15 Claims**

1. An improved fluid useful in the drilling of wells wherein a micellar dispersion comprised of water, hydrocarbon and petroleum sulfonate is used as the drilling fluid, wherein the improvement comprises using as the drilling fluid a water-external microemulsion comprised of about 10 to about 90% by volume water, about 5 to about 90% by volume hydrocarbon, about 1% to about 30% by volume of a sodium petroleum sulfonate having an average equivalent weight within the range of 350 to about 525, and about 0.01 to about 15% by weight, based on the water, of a water-dispersible clay.

11. In a process of drilling a well wherein a micellar dispersion comprised of hydrocarbon, water and petroleum sulfonate is used as a circulating drilling fluid, wherein the improvement comprising circulating in said well a water-external microemulsion which exhibits improves resistivity properties to permit better interpretation of electrical logging of the well and also which exhibits low fluid loss properties, the microemulsion comprised of about 50 to about 90% by volume water, about 10% to about 90% by volume of hydrocarbon, about 1 to about 30% of a sodium petroleum sulfonate having an average equivalent weight within the range of about 350 to about 525, about 0.01 to about 20% of an alcohol containing about 1 to about 20 carbon atoms, about 0.001 to about 5% by weight, based on the water, of an inorganic salt, about 0.1 to about 15% by weight, based on the water, of bentonite clay finely dispersed in the water phase, and up to about 705 of barite, finely dispersed in the water phase.

3,899,432
ALL-PURPOSE LUBRICATING OIL COMPOSITION WITH ANTI-CHATTER CHARACTERISTICS FOR WET DISC BRAKES

Kenneth Rothert, San Francisco; Donald D. Dexter, Concord, and Lester M. Hartmann, Tiburon, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed June 3, 1974, Ser. No. 475,687
Int. Cl. C10m *1/48*, *1/46*
U.S. Cl. 252—32.7 E **6 Claims**

1. A lubricating oil composition comprising:

A. a major amount of an oil of lubricating viscosity, and
B. an effective amount of each of:
1. an oil-soluble substantially neutral Group II metal salt of a hydrocarbyl sulfonic acid;
2. an oil-soluble overbased Group II metal salt of a hydrocarbyl sulfonic acid;
3. an oil-soluble Group II metal salt of a dihydrocarbyl dithiophosphoric acid;
4. tricresyl phosphate; and
5. a sulfurized mixture of C^{10-25} olefins and fatty acid esters of C^{10-25} fatty acids and C^{1-25} alkyl or alkenyl alcohols, in an olefin-to-ester mol ratio of about 1-2:1 wherein the fatty acid and/or alcohol is unsaturated.

3,899,433
METHOD OF METALWORKING UTILIZING A PARTICULAR LUBRICANT COMPOSITION

Alvin J. Unick, Baton Rouge, La., and Kenneth W. Gault, Newnan, Ga., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 267,384, June 29, 1972, abandoned, which is a division of Ser. No. 828,384, May 27, 1969, Pat. No. 3,676,348. This application Feb. 16, 1973, Ser. No. 332,997The portion of the term of this patent subsequent to July 11, 1989, has been disclaimed.

Int. Cl. C10m *1/20*

U.S. Cl. 252—52 R **21 Claims**

1. In a process for working a metal wherein the metal is subjected to lubrication with a lubricant, the improvement wherein the lubricant consists essentially of:

Component A which is unsubstituted substantially saturated aliphatic monohydric normal alcohol containing from about 20 to about 34 carbon atoms per molecule,

Component B which is unsubstituted aliphatic monohydric or dihydric non-normal alcohol containing from about 20 to about 34 carbon atoms per molecule and having less than about 5 percent unsaturated molecules,

Component C which is hydrocarbon having from about 20 to about 34 carbon atoms per molecule,

the amount of Component C being up to about 99 percent by weight and the amount of Component A and Component B being at least 1 percent by weight,

the weight ratio of Component A to Component B ranging from about 10 to 1 to about 1 to 10.

12. In a process for working a metal wherein the metal is subjected to lubrication with a lubricant, the improvement wherein the lubricant consists essentially of:

Component A which is unsubstituted substantially saturated aliphatic monohydric normal alcohol containing from about 20 to about 34 carbon atoms per molecule,

Component B which is a mixture of unsubstituted aliphatic alcohols having from about 20 to about 34 carbon atoms per molecule and having less than about 5 percent unsaturated molecules therein, said Component B containing,

a. branched primary monohydric alcohols,

b. secondary monohydric alcohols, and

c. dihydric alcohols,

the weight ratio of (c) to (b) being up to about 1:1 and the weight ratio of (b) to (a) being up to about 2:1,

Component C which is a compatible halohydrocarbon diluent,

the amount of Component C being up to about 99 percent by weight and the amount of Component A and Component B being at least 1 percent by weight,

the weight ratio of Component A to Component B ranging from about 10 to 1 to about 1 to 10.

3,899,434
HYDROXYLATED POLYMERS USEFUL AS ADDITIVES FOR FUELS AND LUBRICANTS

John Brooke Gardiner, Mountainside, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Oct. 1, 1973, Ser. No. 402,609

U.S. Cl. 252—52 R **7 Claims**

1. A composition comprising a major proportion of a lubricant or a normally liquid hydrocarbon fuel and dissolved therein a minor, dispersant and/or V.I. improving proportion of an oil-soluble hydroxylated olefin polymer, said hydroxylated olefin polymer having sludge dispersing ability and a molecular weight in the range of about 1,000 to 500,000 M_n, said hydroxylated olefin polymer containing about .1 to about 15.0 wt. % oxygen, based on the weight of said hydroxylated polymer, wherein said hydroxylated polymer is the reaction product of a halogen containing polymer having 0.1 to 7.0 wt. % halogen, and an alkali metal salt of a polyol,

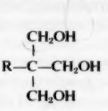
wherein said halogen containing polymer is selected from the group consisting of:

a. halogenated copolymer of ethylene and a C_3 to C_{18} straight or branched chain α-olefin;

b. halogenated terpolymer of ethylene, a C_3 to C_{18} straight or branched chain α-olefin and a C_5 to C_{14} acyclic or alicyclic non-conjugated diolefin; and

c. terpolymer of ethylene, a C_3 to C_{18} straight or branched chain α-olefin and a C_5 to C_{14} acyclic or alicyclic halo-olefin containing 1 to 2 halogens per halo-olefin molecule; wherein said polymers of (a), (b), and (c) comprise in the range of about 30 to 85 mole % ethylene, about 15 to 70 mole % of said C_3–C_{18} alpha olefin, and up to about 20 mole % of said diolefin or said halo-olefin,

wherein said polyol has the formula:



wherein R is selected from the group consisting of hydrogen, C_1 to C_{20} straight or branched chain alkyl radicals, methylol, hydroxy alkyl and pentaerythritol radicals; and wherein said polyol has one hydroxy group metallated to form said alkali metal salt of a polyol.

3,899,435
FERROELECTRIC CERAMIC COMPOSITIONS

Kiichi Minai, Kyoto; Isamu Inada; Kenji Ozawa, both of Osaka, and Kenji Okochi, Youkaichi, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation-in-part of Ser. No. 207,853, Dec. 14, 1971, abandoned. This application Jan. 12, 1973, Ser. No. 323,297

Int. Cl. C04b *35/46*, *35/48*

U.S. Cl. 252—62.9 **2 Claims**

1. Ferroelectric ceramic compositions comprising the ternary system ceramic composition which is represented by the general formula: $x\mathrm{Pb}(\mathrm{Nb}_{\alpha}\ \mathrm{Cr}_{2-3\alpha}\ \mathrm{Mn}_{2\alpha-1})\mathrm{O}_3-y\mathrm{PbTiO}_3-z\mathrm{PbZrO}_3$ wherein x, y and z are the respective molecular ratios of each component $x+y+z=1.00$ and $0.525<\alpha<0.625$, said compositions falling within the polygon encompassed by the points A, B, C, D, E, F and G in the attached FIG. 1, the sets of molecular ratios at the vertices of said polygon being as follows:

	x	y	z
A	0.30	0.40	0.30
B	0.10	0.60	0.30
C	0.01	0.60	0.39
D	0.01	0.14	0.85
E	0.10	0.05	0.85
F	0.20	0.10	0.70
G	0.30	0.20	0.50.

3,899,436

MACHINE DISHWASHING DETERGENT HAVING A REDUCED CONDENSED PHOSPHATE CONTENT

James L. Copeland, Bloomington, and William G. Mizuno, St. Paul, both of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

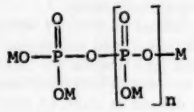
Continuation-in-part of Ser. No. 70,528, Sept. 8, 1970, abandoned. This application Nov. 10, 1972, Ser. No. 305,596

Int. Cl. C11d 7/38

U.S. Cl. 252—99 21 Claims

1. In the process of preparing a low-foaming or nonfoaming machine dishwashing detergent composition from the components comprising:

1. an alkaline condensed phosphate salt generally characterized by the structural formula



wherein M is hydrogen or an alkali metal, at least one M being an alkali metal, and

n is an integer ranging from 1 to 60; and

2. 2 – 80% by weight, on a dry basis, of a nonsequestering, alkaline, pH-adjusting or buffering detergent builder salt; said detergent Composition having a pH of about 10.0 to 12.8 and a Ross-Miles foam height, determined at a concentration of 0.1 percent by weight of said detergent composition in water, of less than 45 mm initially and less than 15mm after five minutes in a column of water maintained at 50°C.; the improvement which comprises:

substituting into said detergent composition at least 5 – 60 parts by weight per 100 parts by weight of said detergent composition, of a water soluble metal salt of citric acid; whereby said salt of citric acid substitutes for part of said condensed phosphate; whereby the amount of said condensed phosphate in the resulting detergent composition is in the range of 0.5 to 35 percent by weight of the resulting detergent composition; and whereby the amount of said detergent builder salt in the resulting detergent composition is within the range of 2 – 80% by weight;

all of the foregoing parts by weight and percentages by weight being on a dry basis.

3,899,437

DENTURE CLEANING COMPOSITION CONTAINING PHOSPHORIC ACID

Barrie F. Regan, 1760 Manor Dr., Hillsborough, Calif. 94010, and Glen B. Regan, 1451 Beach Park Blvd. No. 203, Foster City, Calif. 94404

Filed Mar. 12, 1973, Ser. No. 340,326

Int. Cl. C11d 3/48

U.S. Cl. 252—106 2 Claims

1. A tooth and denture cleaning composition consisting essentially of 1–3% by weight orthophosphoric acid, 0.25 to 1.5% by weight of a non-ionic detergent, 0.01 to 0.04% by weight of a quaternary ammonium germicide, 5 to 10% by weight glycerine, 25 to 35% by weight diatomaceous earth, 0.3 to 1.5% by weight of xanthan gum and the remainder water.

3,899,438

SIMULTANEOUS REACTION AND DISPERSION OF 4,4-ETHYLENE DIANILINE-SALT MIXTURES TO FORM COMPLEXES THEREOF

James Kalil, Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

Filed Oct. 17, 1973, Ser. No. 407,266

Int. Cl. C08g 22/16; C08b 27/72; C09k 3/00

U.S. Cl. 252—182 12 Claims

1. In a process for forming a complex of 4,4′-methylene dianiline (MDA) and an alkali metal salt selected from the group consisting of sodium chloride, sodium bromide, sodium iodide, lithium chloride, lithium bromide, lithium iodide, and sodium cyanide, the mole ratio of MDA/salt in said complex being 3:1, the improvement comprising adding to the MDA/salt mixture 1) at least about 0.5 parts of water per 100 parts of salt but not enough to dissolve all the salt until the complex-forming reaction is at least 50% complete, and 2) 2–35 parts of an inert liquid carrier per part of salt; conducting the reaction between the MDA and salt with agitation, and recovering directly from said reaction a dispersion of MDA/salt complex particles of such fineness that at least 95% have a maximum diameter of about 10 microns.

3,899,439

METHOD OF PREPARING AQUEOUS DISPERSIONS OF HYDROXYPROPYL CELLULOSE

Bert H. Mahlman, West Chester, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 12, 1973, Ser. No. 340,403

Int. Cl.² B01J 13/00

U.S. Cl. 252—311 3 Claims

1. A method of preparing a stable dispersion of a normally water-soluble hydroxypropyl cellulose in a predominantly aqueous medium which comprises incorporating said hydroxypropyl cellulose into said predominantly aqueous medium, bringing the temperature of the system to a temperature between about 5°C. above the cloud point and 15°C. below the cloud point and thereafter raising the temperature to at least about 10°C. above the cloud point while subjecting the system to agitation, said predominantly aqueous medium comprising water and an organic material selected from the class consisting of

a. primary aliphatic alcohols having the hydroxyl group attached to a chain of 3 to 6 carbon atoms,

b. aliphatic amines having 5–8 carbon atoms,

c. methylene chloride,

d. nitromethane, and

e. acrylonitrile,

said organic material being present in an amount sufficient to insolubilize the hydroxypropyl cellulose in water.

3,899,440

APPARATUS FOR CONTINUOUS ACID TREATMENT OF SOAPSTOCK

Yngve Birger Löwenhaupt Hoffmann, Helsingborg, Sweden, assignor to AB Pellerin/Zenith, Helsingborg, Sweden

Filed Jan. 17, 1974, Ser. No. 434,007

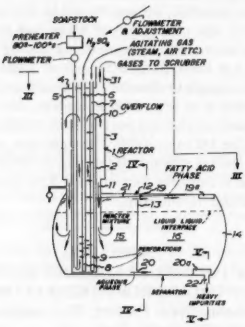
Claims priority, application Sweden, Jan. 18, 1973, 73006793

Int. Cl.² B01D 1/14; C11D 13/00

U.S. Cl. 252—371 5 Claims

1. An apparatus for continuous acid treatment of soapstock which has been obtained from the refining of fats, including fatty oils, with lye, and which contains fatty acid soaps, whereby the fatty acid soaps are converted into free fatty acids, characterized in that it comprises an elongate vertical reaction vessel (1) consisting of an inner vessel (2) which is closed at the bottom and open at the top to form an overflow

(10), an outer vessel (3) which is open at the bottom and has a cover (4) at its upper end and which is arranged around the inner vessel (2) so that an annular outlet space (11) is formed between said vessels (2, 3), the reaction vessel having a supply pipe (5) for soapstock, a supply pipe (6) for acid and a supply pipe (7) for gas for agitating reaction mixture of soapstock and acid in the inner vessel (1), said pipes (5, 6, 7) extending through the cover (4) down into the inner vessel (2) and terminating just above the bottom thereof, and the supply pipe (5) for soapstock opening at the bottom of the inner vessel (2), while the supply pipe (6) for acid is closed at its lower end and has perforations (8) along its extension in the lower part of the inner vessel (2) for successively supplying acid, and the tubular agitating means (7) which also is closed at its lower



end, has perforations (9) along substantially its entire extension in the inner vessel (2) for supplying gas acting as agitating medium, and that the reaction vessel (1) through the overflow (10) and the outlet space (11) is in direct communication with a separating device (12) for withdrawing reacted mixture of soapstock and acid from said reaction vessel (1) to said separating device (12) which includes one or more serially interconnected containers for gravitationally separating the reacted mixture, because of its different densities, into a lighter fatty acid and a heavier aqueous solution separated therefrom, said separating device (12) being provided at its upper part with an outlet (23) for fatty acid and at its lower part with an outlet (25) for aqueous solution, and the reaction vessel (1) and the separating device (12) being substantially closed to the outer surrounding.

JBP

3,899,441

REJUVENATION OF DAMAGED ZEOLITE-SUPPORTED METAL CATALYSTS

Rowland C. Hansford, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 170,619, Aug. 10, 1971, abandoned, which is a continuation-in-part of Ser. No. 874,063, Nov. 4, 1969, abandoned. This application Jan. 8, 1973, Ser. No. 321,670

Int. Cl. B01j *11/18, 11/16*

U.S. Cl. 252—411 R **16 Claims**

11. A method for rejuvenating and redispersal of catalytic metal of a catalyst comprising a Group VIII metal supported on particulate aggregates of a siliceous zeolite and a relatively non-zeolitic inorganic oxide binder, said catalyst having been compounded by a procedure which yields mechanically stable calcined aggregates having a crushing strength above about 20 pounds per ⅛ inch pellet, and whose mechanical strength is not increased or decreased more than about 10% by any of the hereinafter recited hydrocarbon conversion, oxidative regeneration or rejuvenation procedures, said catalyst having been utilized in a hydrocarbon conversion process to substantial deactivation and subsequently regenerated by oxidative combustion, and during said hydrocarbon conversion and/or regeneration having been subjected to thermal or hydrothermal conditions of sufficient severity to bring about a maldistribution of said Group VIII metal with resultant loss in hydrogenation activity wherein a substantial proportion of the maldistributed metal is in the form of agglomerates of less than 50 A in diameter, which comprises:

1. contacting said catalyst, in its oxidized regenerated state and at a temperature below about 300°F., either simultaneously or in the order named, with water or water vapor and with ammonia to effect adsorption therein of about 5–40 weight-percent of water and about 5–35 weight-percent of ammonia based on the weight of adsorbed water;
2. stripping the resulting hydrated, ammoniated catalyst in a stream of non-reducing gas at temperatures between about 250° and 500°F. to effect substantial deammoniation and partial drying with removal of at least about one-half of the water added in step (1); and
3. calcining the partially dried and deammoniated catalyst in a stream of oxygen-containing gas at progressively increasing temperatures between about 500° and 1200°F., controlled to maintain the dewpoint of the effluent gas stream below about 40°F., at least the terminal portion of said calcining being carried out at temperatures between about 750° and 1200°F. for a sufficient length of time to produce an effluent gas stream having a dewpoint below about 0°F., and a substantially completely dehydrated and deammoniated catalyst having improved hydrogenation activity.

14. A method as defined in claim **11** wherein said Group VIII metal is a noble metal, and said zeolite is a molecular sieve of the Y crystal type wherein the zeolitic cations are primarily hydrogen ions and/or polyvalent metal ions.

15. A method as defined in claim **14** wherein said noble metal is palladium and wherein the zeolitic cations in said Y molecular sieve comprise a substantial proportion of hydrogen ions.

3,899,442

RECOVERY AND REACTIVATION OF RHODIUM HYDROFORMYLATION CATALYSTS

John P. Friedrich, Green Valley, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 31, 1974, Ser. No. 438,307

Int. Cl.² B01D *15/06;* **B01J** *37/12;* **C11C** *3/02;* **C07C** *45/02*

U.S. Cl. 252—416 **5 Claims**

1. In a method for recovering and reactivating rhodium catalysts in a process wherein unsaturated hydrocarbons, or unsaturated fatty compounds are hydroformylated at temperatures of about 100° to 300° C. with hydrogen and carbon monoxide under pressures of from atmospheric pressure to 3000 p.s.i.g. in the presence of a catalyst consisting of rhodium metal on a relatively inert support admixed with a trisubstituted phosphine, and wherein the hydroformylated reaction products are filtered and distilled leaving a residue which contains essentially all of the soluble rhodium, the improvement comprising the following steps:

a. mixing said residue with a refractory catalyst support;
b. volatilizing and carbonizing essentially all organic materials present in the mixture resulting from step (b) by heating said mixture to from 150° to 450° C. in an atmosphere such that volatile materials given off will be prevented from igniting;
c. reacting in a suitable vessel essentially all of the carbonized material remaining from step (b) with oxygen contained in air at a temperature of from 350° to 1000° C. for a length of time sufficient to form carbon dioxide and water; and
d. cooling said vessel and removing the resulting resupported catalyst.

3,899,443

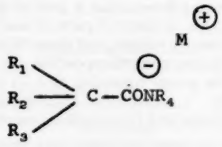
NOVEL COCATALYST SYSTEM FOR TRIMERIZING POLYISOCYANATES

Harold E. Reymore, Jr., Wallingford, and John K. Zane, East Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 30, 1974, Ser. No. 437,781
Int. Cl. C08f 47/10; C08g 22/44
U.S. Cl. 252—431 C 8 Claims

1. In a catalyst system for the trimerization of a polyisocyanate which consists essentially of a tertiary amine trimerization catalyst, the improvement wherein said catalyst contains

i. from about 20 to about 80 mole percent of an amide salt having the formula



wherein M is an alkali metal, R_1, R_2, R_3 can be the same or different and are selected from the group consisting of H, lower alkyl, aryl, aralkyl, and cycloalkyl, R_4 is selected from the group consisting of lower alkyl and aryl;

ii. from about 3 to about 30 mole percent of a dibutyl tin di(alkanoate) wherein the alkanoate residue contains from 2 to 12 carbon atoms, inclusive; and

iii. from about 10 to about 70 mole percent of said tertiary amine trimerization catalyst.

3,899,444

EXHAUST GAS CATALYST SUPPORT

Ruth E. Stephens, Royal Oak, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 224,240, Feb. 7, 1972. This application Dec. 22, 1972, Ser. No. 317,831
Int. Cl. B01j 11/40, 11/06, 11/32
U.S. Cl. 252—455 R 42 Claims

1. A catalyst useful in treating exhaust gas of internal combustion engines, said catalyst consisting essentially of an alumina matrix containing a catalytic metal selected from the group consisting of the metals of Groups I-B, V-B, VI-B, VII-B and VIII of the Periodic Table in an oxide form and a rare earth metal oxide, the atom ratio of said catalytic metal to said rare earth metal to aluminum being 0.1–1 to 0.8–1.4 to 8–20, said catalytic metal oxide and rare earth metal oxide being substantially uniformly distributed throughout said alumina matrix.

16. A catalyst of claim 1 wherein said alumina matrix consists essentially of an alumina coating on the surface of a refractory selected from the group consisting of zirconia, alumina, magnesia, silica, and mixtures thereof, said alumina coating containing a catalytic metal selected from the group consisting of the metals of Groups I-B, V-B, VI-B, VII-B and VIII of the Periodic Table in an oxide form and a rare earth metal oxide substantially uniformly distributed in said matrix, the atom ratio of said catalytic metal to said rare earth metal to aluminum in said alumina coating being 0.1–1 to 0.8–1.4 to 8–20.

3,899,445

CATALYST FOR OXIDATION OF ETHYLENE TO ETHYLENE OXIDE

Tsunesuke Kajimoto, and Shigeru Wakamatsu, both of Kamakura, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 258,522, June 1, 1972, Pat. No. 3,838,481. This application Jan. 8, 1973, Ser. No. 321,911The portion of the term of this patent subsequent to Sept. 17, 1991, has been disclaimed.
Int. Cl. B01j 11/08
U.S. Cl. 252—462 17 Claims

1. A catalyst composition for the oxidation of ethylene to ethylene oxide which comprises silver catalyst and, as a moderator, at least one rare earth metal selected from the group consisting of praseodymium, neodymium, terbium and dysprosium, which is prepared by coating a carrier with a slurried solution which contains reduced silver in the form of silver powder and a salt of at least one rare earth metal selected from the group consisting of praseodymium, neodymium, terbium and dysprosium and drying the coated carrier, wherein said reduced silver is prepared as silver powder by the chemical reaction of silver oxide in an aqueous solution, and wherein the reduced silver and the salt of the rare earth metal are previously combined by immersing the reduced silver into an aqueous solution of a soluble salt of said rare earth metal, adding thereto an aqueous solution of alkali or alkaline earth hydroxide thereby converting said soluble salt of said rare earth metal into the insoluble hydroxide and precipitating said insoluble hydroxide on the reduced silver, filtering off the combined reduced silver and precipitated rare earth metal hydroxide, and washing them with water.

3,899,446

PROCESS FOR PREPARING COPPER-CHROMIUM CATALYSTS

Bunji Miya; Katsuji Kasutani; Morio Matsuda; Akio Hashimoto; Shiyozo Nisigawa, and Youzi Sawamoto, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1974, Ser. No. 438,467
Claims priority, application Japan, Feb. 2, 1973, 48-13471
Int. Cl.[2] B01J 23/16, 23/64, 23/84
U.S. Cl. 252—467 10 Claims

1. A process for preparing a copper-chromium catalyst, which comprises dissolving 0.5 to 3 moles of chromic acid anhydride in water, adding 1 mole of cupric oxide to the obtained aqueous solution and effecting the reaction of said cupric oxide with said chromic acid anhydride; adding to the reaction mixture a reducing agent selected from the group consisting of formaldehyde, methanol, formic acid and oxalic acid, said reducing agent being transformed into carbon dioxide and water by oxidation, the amount of reducing agent added being such that its reducing effect corresponds to the reducing effect of from 0.1 to 1 mole of formaldehyde, and effecting the reduction of chromium (VI) of the unreacted chromic acid anhydride to chromium (III); further adding 0.9 to 8.0 moles of ammonia to the reaction mixture and effecting its reaction with the reaction mixture; drying the resulting mixture by evaporation and calcining the dried mixture to obtain the catalyst product.

3,899,447

DETERGENT COMPOSITIONS CONTAINING SILICA COLLOIDS

Louis McDonald, Altadena, Calif., assignor to Louis McDonald, Altadena, Calif.

Division of Ser. No. 700,004, Jan. 24, 1968, Pat. No. 3,708,428. This application Dec. 27, 1972, Ser. No. 318,996The portion of the term of this patent subsequent to Jan. 2, 1990, has been disclaimed.

Int. Cl. C11d 9/10

U.S. Cl. 252—539 9 Claims

1. An aqueous detergent composition comprising (a) an alkali salt of an anionic detergent forming acid and (b) a colloidal silica sol, (a) and (b) being formed in situ by reaction of a corresponding water soluble alkali silicate and anionic detergent forming acid in such proportion as to yield a composition not greater than 0.2 N in alkali ion, the silica sol of said detergent composition being alkali-stabilized within a pH range of 7.2 to 11.0.

3,899,448

DETERGENT CONCENTRATE

Edward Tunstall Messenger, and Douglas Edward Mather, both of Cumberland, England, assignors to Albright & Wilson Ltd., West Midlands, England

Filed Feb. 1, 1973, Ser. No. 328,692

Claims priority, application United Kingdom, Feb. 7, 1972, 05519/72; May 26, 1972, 25054/72

Int. Cl. C11d 1/12

U.S. Cl. 252—551 27 Claims

1. An aqueous concentrate comprising 50–70% by weight of a sulphated alkoxylated alcohol salt, said salt being a water soluble sulphate of an alcohol having 8–24 carbon atoms which has been condensed with a total of from 1 to 4 ethylene oxide or propylene oxide groups, and from 1 to 10% by weight based on the total weight of the concentrate of an aromatic sulphonate, said sulphonate being an alkali metal, alkaline earth metal, alkanolamine, amine or ammonium salt of an aromatic sulphonic acid of the formula:

$$R_uY_nAr(SO_3H)_bX_c$$

where

R is an alkyl group of from 1 to 4 carbon atoms

Y is a carboxlic group

Ar is a benzene nucleus

X is a hydroxyl group or an alkoxy group of from 1 to 4 carbon atoms

a is 0 to 3

b is 2 to 3

c is 0 to 3

u is 0 to 4

3,899,449

LOW TEMPERATURE COEFFICIENT OF RESISTIVITY CERMET RESISTORS

Clifford Joseph Pukaite, Mequon, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed May 11, 1973, Ser. No. 359,244

Int. Cl.² H01B 1/06

U.S. Cl. 252—518 14 Claims

1. A cermet resistor composition having a low temperature coefficient of resistivity and adapted to be fused to a substrate composed of high temperature, electrically nonconductive material comprising: a conductive phase composed of vanadium oxide in the range from about 1.00 to about 10.00 weight percent and ruthenium dioxide in the range of from about 1.00 to about 30.00 weight percent, and an interdispersed glass phase in the range of about 50.00 to about 98.00 weight percent, said glass phase composed of lead oxide in the range of about 35.00 to about 45.00 weight percent, boron trioxide in the range of about 15.00 to about 25.00 weight percent and silicon dioxide present in the range of about 30.00 to about 40.00 weight percent.

3,899,450

DYE PENETRANT COMPOSITION CONTAINING A VOLATILE DEGREASER-TYPE SOLVENT

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 329,775, Feb. 5, 1973, Pat. No. 3,789,221. This application Oct. 3, 1973, Ser. No. 403,298

Int. Cl.² G01N 21/16; C09K 11/06

U.S. Cl. 252—301.2 P 12 Claims

1. A liquid dye penetrant composition for use in nondestructive testing for detecting cracks and flaws in a specimen surface, which consists essentially of about 0.2% to about 45% by volume of an N-alkyl-2-pyrrolidone, said alkyl group containing from 1 to 4 carbon atoms, a dye which is soluble in said pyrrolidone, the ratio of said dye to said pyrrolidone in said composition ranging from about 1 part of dye to about 25 parts of pyrrolidone, to about 2 parts of said dye to about 1 part of pyrrolidone, by volume, and about 50 to about 97% by volume of said dye penetrant composition, of a volatile solvent selected from the group consisting of 1,1,1-trichloroethane, trichloroethylene, 1,1,2-trichloro-1,2,2-trifluoroethane, trichlorofluoromethane and bromotrifluoromethane.

3,899,451

OXIDE VARISTOR

Noboru Ichinose, and Yuhji Yokomizo, both of Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Sept. 11, 1973, Ser. No. 396,135

Claims priority, application Japan, Sept. 11, 1972, 47-90446; Sept. 11, 1972, 47-90447; Sept. 18, 1972, 47-92897

Int. Cl.² H01B 1/08

U.S. Cl. 252—520 5 Claims

1. An oxide varistor prepared from a basic composition consisting of a total of 70 to 14 mol % of at least one compound of the formula $Me'O_2$, 29 to 85 mol % of ZnO and 1 to 20 mol % of Sb_2O_3, and containing 1 to 20 % by weight of Bi_2O_3, and a total of 0.5 to 10 % by weight of at least one Me''_2O_3 based on the weight of said basic composition, wherein said Me′ is selected from the group consisting of Ti, Sn and Zr, said Me″ is selected from the group consisting of Fe, Cr, Mn and Co.

3,899,452

CELLULOSIC FILM HAVING INCREASED STIFFNESS

Walter T. Koch, Havertown, and Edward A. Wielicki, Philadelphia, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 8, 1971, Ser. No. 187,918

Int. Cl.² C08J 9/32

U.S. Cl. 260—2.5 B 7 Claims

1. A non-fibrous, self-supporting cellulosic film having dispersed therein from about one up to about 25 percent, based on the weight of the cellulosic, of rigid hollow microspheres having a bulk density in the range of 0.2 to 20 pounds per cubic foot and diameters ranging from one and 100 microns.

3,899,453

HYDROXYALKYLCARBAMYLALKYLPHOSPHONATE FLAME RETARDANTS FOR POLYURETHANES

Edward N. Walsh, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

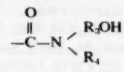
Division of Ser. No. 54,579, July 13, 1970, Pat. No. 3,742,095, which is a continuation-in-part of Ser. No. 644,073, June 7, 1967, abandoned. This application Mar. 16, 1973, Ser. No. 341,840

Int. Cl. C08g 51/60

U.S. Cl. 260—2.5 AJ 4 Claims

1. A fire retardant polyurethane resinous material which comprises in admixture a polyisocyanate, a polyol, and a hydroxyalkylcarbamylalkylphosphonate fire retardant com-

pound of the formula:



wherein R is a divalent saturated carbon linking chain having from 1 to 4 carbon atoms in said chain; R_1 and R_2 are radicals independently selected from the group consisting of alkyl, haloalkyl and hydroxyalkyl; R_3 is an aliphatic hydrocarbon radical having from 2 to 10 carbon atoms; and R_4 is a radical selected from the group consisting of hydrogen, alkyl haloalkyl and hydroxyalkyl.

3,899,454

PROCESS FOR THE PRODUCTION OF SYNTHETIC PLASTICS COMPRISING URETHANE GROUPS AND BIURET GROUPS

Kuno Wagner, Leverkusen; Werner Dietrich, Cologne; Karl-Josef Kraft, Leverkusen, and Horst Conrad, Durmagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

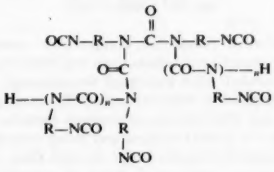
Continuation-in-part of Ser. No. 264,641, June 20, 1972, abandoned, which is a continuation of Ser. No. 036,500, May 11, 1970, abandoned. This application May 16, 1973, Ser. No. 360,883

Claims priority, application Germany, May 13, 1969, 1924302The portion of the term of this patent subsequent to Feb. 19, 1991, has been disclaimed.

Int. Cl.[2] C08G 18/79, 18/14

U.S. Cl. 260—2.5 AT 7 Claims

1. A process for the production of polyurethane foams which comprises reacting in the presence of a blowing agent an organic polyisocyanate with a polyhydroxyl polyether containing from four to six hydroxyl groups, a polycaboxyl compound or a mixture of polyhydroxyl polyether containing from four to six hydroxyl groups and polycarboxyl compounds wherein the polyisocyanate is a solution in a monomeric polyisocyanate of from about 1 to about 85 percent of a biuret polyisocyanate having the formula:



in which

R is an aromatic, araliphatic or cycloaliphatic radical and wherein n is an integer of from 0 to 5 and the proportion of biuret-polyisocyanate having more than three isocyanate groups is at least 20 percent by weight based on the total quantity of biuret-polyisocyanates and the solution contains from about 0.03 to about 5 percent by weight of the polyisocyanates of a chemically combined emulsifier selected from the group consisting of hydroxyl containing oleyl alcohol polyglycol ether, castor oil polyglycol ether, isononylphenol polyglycol ether, 3-benzyl-4-hydroxy diphenyl polyglycol ether, higher molecular weight n-dodecyl polyglycol ethers having a terminal OH group and the corresponding amine derivatives obtained by cyanoethylation and subsequent hydrogenation of the foregoing compounds.

3,899,455

PROCESS FOR PREPARING LIGHTWEIGHT CONCRETE

Leo Unterstenhoefer, Limburgerhof, and Wilhelm Krieger, Ludwigshafen, both of Germany, assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Apr. 18, 1974, Ser. No. 461,946

Int. Cl. C08f 47/08

U.S. Cl. 260—2.5 B 9 Claims

1. In a method of preparing lightweight concrete compositions containing hydraulic binder, water and closed cell foamed polystyrene particles the improvement of increasing the adhesion of the foamed particles to the cured or set concrete composition comprising surface coating the closed cell foamed particles prior to their incorporation into the lightweight concrete mixture with a phenol containing (1) coal tar or (2) anthracene oil and cross-linkable phenolic resin blend.

3,899,456

SILOXANE VULCANIZATES AND A METHOD FOR THE PREPARATION THEREOF

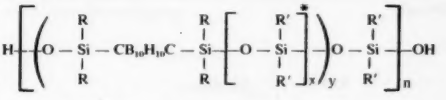
John F. Sieckhaus, Milford; Robert N. Scott, Wallingford, and Trescott B. Larchar, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 19, 1974, Ser. No. 443,273

Int. Cl.[2] C08L 91/00

U.S. Cl. 260—18 S 10 Claims

1. A method for preparing siloxane vulcanizates comprising adding a polymer of the following formula:



wherein each R is independently selected from the group consisting of an alkyl group of one to 10 carbon atoms and an aryl group of six to 14 carbon atoms; each R′ is independently selected from the group consisting of an alkyl group of one to 10 carbon atoms, an aryl group of six to 14 carbon atoms and a phenyl group containing an electron donating substituent selected from the group consisting of o-, m- and p-alkyl of one to four carbons, dialkyl and trialkyl of one to four carbon atoms, p-amino, o- and p-alkoxy of one to four carbon atoms, o-, m- and p-trimethylsilylmethyl and p-phenyl; x is 0 to 4; y is 1; n is about 20 to about 10,000 with the proviso that at least one R′ is said substituted phenyl group to a Lewis acid catalyst and then curing said mixture at a temperature of from about 15 to about 30°C.

3,899,457

ETHERIFIED METHYLOLATED 2,7-DIOXO-4,5-DIMETHYL-DECAHYDRO-PYRIMIDO-[4,5-D]-PYRIMIDINE AND ITS USE IN ALKYD RESIN COATING COMPOSITIONS

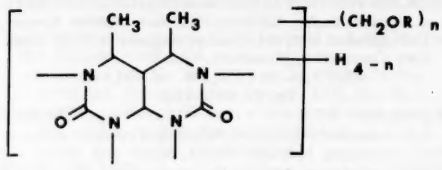
Alan L. Peterkofsky, Newark; James E. Tracy, Bernardsville, and Paul M. Schumacher, Hackettstown, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 135,747, April 20, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,487

Int. Cl. B32b 27/06; C09d 3/52, 3/66

U.S. Cl. 260—21 9 Claims

1. A coating composition comprising an alkyd resin and an esterified aminoplast material, (C), of the formula:



wherein *n* is an integer from 1 to 4 and R is a hydrogen substituent or the residue of a monohydric alcohol, at least one of said R groups being said alkyl residue.

3,899,458

ETHERIFIED TRIMETHYLOLATED CROTONYLIDENEDIUREA AND ITS USE IN ALKYD RESIN COATING COMPOSITIONS

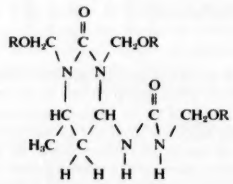
Alan L. Peterkofsky, Newark; James E. Tracy, Bernardsville, and Paul M. Schumacher, Hackettstown, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 135,749, April 20, 1971, abandoned. This application Sept. 12, 1973, Ser. No. 396,943

Int. Cl. B32b *27/06;* **C09d** *3/52, 3/66*

U.S. Cl. 260—21 **9 Claims**

1. A coating composition comprising an alkyd resin and an etherified trimethylolated crotonylidenediurea (C) of the formula



wherein R is H or the residue of a monohydric alcohol, at least one of said R moieties being the residue of a monohydric alcohol.

3,899,459

PRODUCTION OF POLYCHLOROPRENE

Paul Branlard, Grenoble, and Jacques Modiano, Varces, both of France, assignors to Distugil, Clichy, France

Filed June 8, 1973, Ser. No. 368,360

Claims priority, application France, July 4, 1972, 72.24839

Int. Cl.[2] C08L *93/00*

U.S. Cl. 260—27 BB **8 Claims**

1. Process for the manufacture of polychloroprene rubber in an aqueous emulsion, comprising polymerizing chloroprene in the presence of a binary system the composition of which, by weight with regard to chloroprene, is from 1 to 2.5% of saturated and/or unsaturated fatty acids and/or alkali-metal salts thereof, and from 3 to 6% of rosin acid derivatives sufficiently modified so that it does not produce a phase separation which results from the formation of a complex between the magnesia, the phenolic resin and the rosin derivative when present together in a polychloroprene adhesive.

3,899,460

2-(PIPERIDINODITHIO)BENZOTHIAZOLES

Joan L. Wilson, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 186,544, Oct. 4, 1971, abandoned. This application Nov. 26, 1973, Ser. No. 419,184

Int. Cl. C07d *277/78*

U.S. Cl. 260—293.57 **4 Claims**

1. The composition of matter, 2(4-methylpiperidinoditho)-benzothiazole.

3,899,461

COPOLYMERS OF AN N-VINYL LACTAM AND A BRANCHED CHAIN ALIPHATIC CARBOXYLIC ACID ESTER

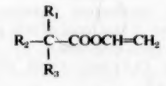
Eugene S. Barabas, Watchung, and Marvin M. Fein, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jan. 26, 1973, Ser. No. 327,106

Int. Cl. C08f *19/00;* **C09d** *5/02*

U.S. Cl. 260—29.6 HN **12 Claims**

1. A copolymer composition, comprising approximately, by weight, (a) 1:99 percent of an N-vinyl lactam selected from the group consisting of N-vinyl-2-pyrrolidone, N-vinyl-2-piperidone, N-vinyl-6-caprolactam, N-vinyl-5-methyl-2-pyrrolidone, N-vinyl-3,3-dimethyl-2-pyrrolidone, N-vinyl-hexahydrophthalamidine, and N-vinyl-anphthostyrile; and (b) 99:1 percent of a branched chain aliphatic carboxylic acid ester corresponding to the formula:



wherein R_1, R_2, and R_3 are saturated alkyl groups.

3,899,462

REINFORCED POLYAMIDE MOLDING COMPOSITION

John Newbould, Sterling Heights; Elio Eusebi, Troy, both of Mich., and Edward G. Bobalek, Orono, Maine, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 29, 1974, Ser. No. 456,226

Int. Cl.[2] C08L *77/02*

U.S. Cl. 260—37 N **5 Claims**

1. A reinforced polyamide composition comprising, by weight, 100 parts of a polyamide resin and from 5 to 220 parts of a finely divided filler dispersed therethrough, said filler being characterized by reactive surface hydroxyl groups, the particles of said filler having an average particle size in the range of from 0.1 to 400 microns and being coated with from 0.1 to 5 percent by weight, based on said filler, of a resole soluble in acetone, said resole being chemically combined with the underlying filler particles by reactions with said hydroxyl groups.

3,899,463

FLAME-RETARDANT COMPOSITION

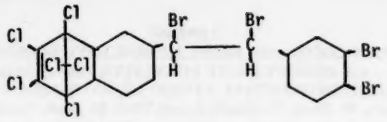
Jack Newcombe, Freehold, N.J., assignor to Cities Service Company, Tulsa, Okla.

Division of Ser. No. 281,692, Aug. 18, 1972, which is a continuation-in-part of Ser. No. 115,081, Feb. 12, 1971, abandoned. This application Oct. 3, 1973, Ser. No. 402,960

Int. Cl. C08f *45/58;* **C08g** *51/58*

U.S. Cl. 260—45.7 R **1 Claim**

1. A composition comprising a normally flammable organic polymer and a flame retardant corresponding to the formula:



said flame retardant being present in an amount of from 1 to 25 percent based upon the combined weights of the organic polymer and flame retardant.

3,899,464

PIPERIDINE DERIVATIVE AND USE THEREOF AS STABILIZERS

Keisuke Murayama; Syoji Morimura; Takao Yoshioka; Toshimasa Toda; Eiko Mori; Hideo Horiuchi; Susumu Higashida; Katsuaki Matsui; Tomoyuki Kurumada; Noriyuki Ohta, and Hisayou Osawa, all of Tokyo, Japan, assignors to Sankyo Co., Ltd., Tokyo, Japan

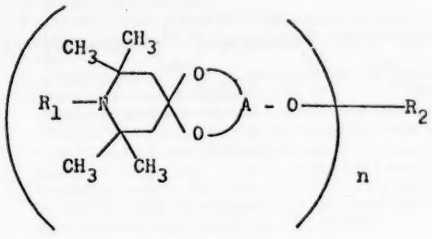
Filed Oct. 11, 1973, Ser. No. 405,570

Claims priority, application Japan, Oct. 26, 1972, 47-107408

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.8 NZ **26 Claims**

1. A composition comprising a synthetic polymeric material and from 0.01 to 5.0 percent by weight, based on the weight of the synthetic polymeric material, of a compound having the formula



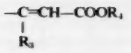
(I)

wherein

R_1 represents a hydrogen atom, an alkyl group, a substituted alkyl group, an alkenyl group, an alkynyl group, a substituted or unsubstituted aralkyl group, an aliphatic acyl group, an alkoxycarbonyl group or an aralkoxycarbonyl group,

n is an integer of 1 to 4,

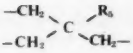
R_2 represents, when n is 1, a hydrogen atom, an aliphatic, aromatic or heterocyclic monoacyl group, an alkyl group, an alkenyl group, an alkynyl group, an aralkyl group, an aryl group, an alkoxyalkyl grup, an epoxyalkyl group, an alkoxysulfonylalkyl, group, an N-substituted carbamoyl group, an N-substituted thiocarbamoyl group, a monovalent group from an oxoacid or a group



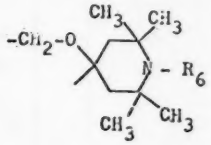
in which R_3 represents a hydrogen atom, a lower alkyl group or a phenyl group and R_4 represents an alkyl group,

when n is 2, R_2 represents a carbonyl group, an aliphatic or aromatic diacyl group, an alkylene group, an alkenylene group, an alkynylene group, an aralyklene group, an N-substituted dicarbamoyl group or a divalent group from an oxoacid, when n is 3, R_2 represents an aromatic triacyl group or a trivalent group from an oxoacid, and

when n is 4, R_2 represents an aromatic tetraacyl group, and A represents a group

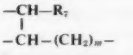


in which R_5 represents a hydrogen atom or a lower alkyl group and, when the above n is 1, R_5 together with R_2 may represent a group



in which R_6 represents the same group as defined under R_1 above and may be the same or different from R_1,

or A represents a group



in which m is 1 or 2, and R_7 represents a hydrogen atom, and, when the above m and n are both 1, R_7 represents a methylene group together with R_2.

3,899,465

SYNERGISTIC ORGANOTIN STABILIZER COMPOSITIONS AND RESINS STABILIZED THEREWITH

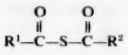
Christian H. Stapfer, Aachen, Germany, assignor to Cincinnati Milacron Chemicals, Incorporated, Reading, Ohio

Continuation-in-part of Ser. No. 189,038, Oct. 13, 1971, Pat. No. 3,822,233, which is a continuation-in-part of Ser. No. 780,888, Dec. 3, 1968, Pat. No. 3,630,993. This application June 18, 1974, Ser. No. 480,487The portion of the term of this patent subsequent to July 2, 1991, has been disclaimed.

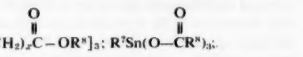
Int. Cl.[2] C08F *6/00*

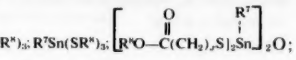
U.S. Cl. 260—45.75 S **10 Claims**

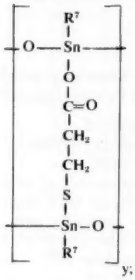
1. A stabilizing composition for vinyl halide resins selected from the group consisting of polyvinyl chloride, polyvinylidene chloride, copolymers of vinyl chloride and vinylidene chloride, copolymers of vinyl chloride with other ethylenically unsaturated monomers and mixtures thereof comprising a synergistic combination of (1) a thiolanhydride corresponding to the formula



wherein R^1 and R^2 are hydrocarbyl radicals containg 6 to 20 carbon atoms and (2) 2.5 to 15 weight per cent based on said thiolanhydride of a monohydrocarbyltin compound corresponding to a formula selected from the group consisting of







$R^9SnS_{1.5}$ and

R^9SnSSH,

wherein R^7 is an alkyl having one to 12 carbon atoms, R^8 is an alkyl having one to 20 carbon atoms; R^9 is an alkyl having one to 12 carbon atoms, x is 1 or 2 and y is at least 2.

3,899,466

BROMINATED XYLENE DIOLS

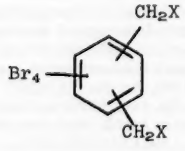
Michael Dubeck, Birmingham, and David R. Brackenridge, Royal Oak, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 70,922, Sept. 9, 1970, abandoned. This application May 25, 1973, Ser. No. 363,790

Int. Cl. C09k *3/28*

U.S. Cl. 260—45.95 L **3 Claims**

1. A polyolefin composition comprising an α-olefin polymer and a flame retardant amount of a tetrabrominated xylene compound of the general formula



wherein X is a hydroxyl radical.

3,899,467

POLYURETHANES FROM 3,3'DIMETHYL DIPHENYL 4,4'-DIISOCYANATE POLYESTER DIOLS AND BIS(HYDROXYETHYL ETHER) OF HYDROQUINONE

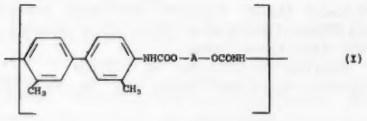
Henry W. Bonk, Wallingford, and Tilak M. Shah, North Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed May 14, 1974, Ser. No. 469,656

Int. Cl. C08g *22/26*

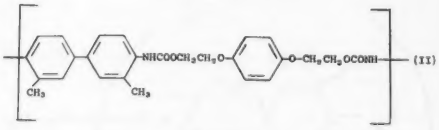
U.S. Cl. 260—47 CB **6 Claims**

1. A high temperature resistant, thermoplastic polyurethane elastomer characterized by the presence therein of each of the recurring units of the following formulae:



(I)

and



(II)

wherein A is the residue of a polyester diol HO—A—OH having a molecular weight in the range of 800 to 3500, the overall proportion of units having the formula (I) to units having the formula (II) in said polyurethane elastomer being within the range of 1:1 to 1:7.

3,899,468

NOVEL INTERPOLYMER OF AMINE, ALDEHYDE AND SULFANILAMIDE

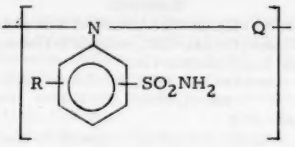
Shirley H. Roth, Highland Park, N.J., assignor to Cities Service Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 291,847, Sept. 25, 1972, abandoned. This application June 27, 1974, Ser. No. 483,859

Int. Cl.[2] C08G *12/08, 12/30, 12/32, 12/36*

U.S. Cl. 260—67.6 R **10 Claims**

1. A water-insoluble amine-sulfonamide-aldehyde interpolymer consisting essentially of (A) about 50–99 mol percent of sulfonamide-aldehyde units corresponding to the formula:



wherein Q is the aldehyde residue and R is hydrogen, alkyl, haloalkyl, alkoxy, haloalkoxy, halo, nitro, acetamido, or sulfonamido and (B) about 50-1 mol percent of amine-aldehyde units wherein the amine is selected from the group consisting of urea, thiourea, ethyleneurea, melamine, guanidine, aminoguanidine, cyanamide, and/or dicyandiamide.

3,899,469

PROCESS FOR THE MANUFACTURE OF NEW CONDENSATES

Arthur Buhler, Rheinfelden; Hans Ulrich Schutz, Basel; Dieter Mausezahl, Biel-Benken; Melvin Harris, Dornach, and Christian Guth, Basel, all of Switzerland, assignors to Ciba Geigy AG, Basel, Switzerland

Division of Ser. No. 104,142, Jan. 5, 1971, Pat. No. 3,776,767, which is a continuation of Ser. No. 768,495, Oct. 17, 1968, abandoned. This application Aug. 15, 1973, Ser. No. 388,517
Claims priority, application Switzerland, Oct. 24, 1967, 14826/67
Int. Cl. C08g *9/32*
U.S. Cl. 260—67.5 **4 Claims**

1. Textile finishing compositions for improving the crease and abrasion resistance of textile materials containing (1) a curable aminoplast precondensate, (2) a condensation product obtained by reacting

A. cyanuric chloride with

B. a member selected from the group consisting of thiourea, sodium-, potassium- and ammonium hydrogensulfide, and

C. a member selected from the group consisting of a monoalkanolamine and a dialkanolamine with 1 to 4 carbon atoms in an aqeous medium at a temperature from about 10° to 30° C at a molecular ratio for (B) as well as for (C) from 1:2 to 1:0.5, then finalizing the reaction at temperatures from 30° to 100° C and removing water from the resulting mixture by distillation, and (3) a curing catalyst, the ratio by weight of aminoplast precondensate: condensation product being from about 10:1 to 10:4.

3,899,470

CONTINUOUS PROCESS FOR PREPARATION OF BASIC DYEABLE POLYESTER

John W. McGee, and Henry L. King, both of Cary, N.C., assignors to Monsanto Company, Decatur, Ala.

Filed Aug. 1, 1973, Ser. No. 384,782The portion of the term of this patent subsequent to Aug. 12, 1992, has been disclaimed.
Int. Cl. C08g *17/01*
U.S. Cl. 260—75 S **14 Claims**

1. A method for producing fiber-forming modified polyesters which comprises (1) forming a reaction product prepolymer consisting of at least 85 percent by weight of the polyester of an aromatic dicarboxylic acid and a polymethylene glycol selected from the group consisting of those having the formula $HO(CH_2)_nOH$, wherein n is an integer from 2 to 10, and cyclohexane dimethanol, by reacting said acid and said glycol under esterification conditions until said reaction product has a carboxyl level of not more than 2000 μ eq/g and an intrinsic viscosity of not more than 0.10; and (2) continuously reacting with said reaction product prepolymer a glycol solution of a bis glycol ester of a difunctional aromatic compound possessing a metallo sulfonate group of such concentration that when said bis glycol ester is mixed with said prepolymer, the resulting glycol/dicarboxylic acid moiety ratio is at least about 1.6; and copolymerizing and polycondensing said reactants at a temperature in the range of from about 120° C to about 300° C until the resulting polymer attains an intrinsic viscosity in the range of about 0.3 to 0.8.

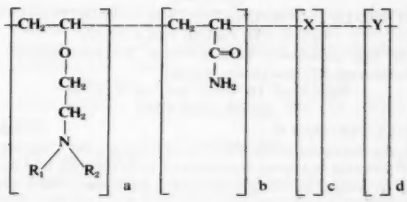
3,899,471

DIALKYLAMINOETHYL VINYL ETHER INTERPOLYMERS

Donald H. Lorenz, Basking Ridge, N.J., and Earl P. Williams, Pen Argyl, Pa., assignors to GAF Corporation, New York, N.Y.

Filed Oct. 21, 1971, Ser. No. 191,538
Int. Cl. C08f *15/02, 15/00*
U.S. Cl. 260—80.73 **12 Claims**

1. A member selected from the group consisting of water-soluble solid dialkylaminoethyl vinyl ether interpolymers of the formula



the salts thereof with inorganic and organic acids wherein R_1 and R_2 are each selected from the group consisting of methyl, ethyl and hydroxyethyl and taken together with the nitrogen atom to which they are attached a heterocyclic ring, X and Y are each vinyl monomers copolymerizable with said other monomer units in said interpolymer wherein the proportions of a, b, c and d of said monomer units in said interpolymer calculated on the basis of weight percent of the interpolymer amount to 80–10 weight percent of a, 70–10 weight percent of b, 30–0 weight percent of c, and 20–0 weight percent of d.

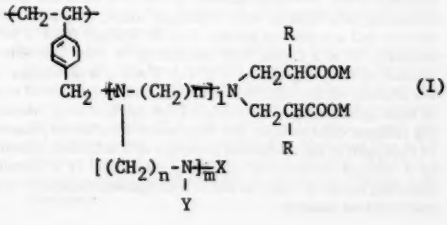
3,899,472

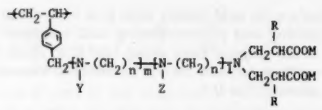
CHELATING RESIN AND PROCESS FOR PREPARING THE SAME

Toshihiko Aya; Kazumasa Chiba, and Zenzi Izumi, all of Nagoya, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Nov. 18, 1974, Ser. No. 524,353
Claims priority, application Japan, Nov. 21, 1973, 48-130083; Mar. 5, 1974, 49-24736
Int. Cl.² C08F *210/00, 212/00*
U.S. Cl. 260—80.78 **7 Claims**

1. A chelating resin having a crosslinked polymer structure whose main structural unit is selected from the group consisting of the following (I) and (II)





(II)

wherein *l* is an integer from 1 – 8, *m* is an integer from 0 – 8, *n* is an integer from 2 – 12, M represents hydrogen, a univalent ion selected from the group consisting of sodium, potassium, lithium and NH_4+, R designates hydrogen or a methyl group, X, Y and Z each represents hydrogen or a group selected from the class consisting of an alkyl group having 1 – 8 carbon atoms, a hydroxyalkyl group having 1 – 8 carbon atoms, an aromatic group having 6 – 9 carbon atoms, an aralkyl group having 7 – 10 carbon atoms and —A—COOM, wherein A represents a divalent alkyl residual group having 1 – 8 carbon atoms and M is as heretofore stated.

3,899,473

METHOD OF INCORPORATING SOLID ADDITIVES INTO VINYL CHLORIDE POLYMERS

Bernt Eric Johansson, Domsjoverken, Sweden, assignor to Kemanord AB, Stockholm, Sweden

Filed Mar. 10, 1972, Ser. No. 233,740
Int. Cl. C08f *1/84*
U.S. Cl. 260—92.8 W **2 Claims**

1. An improved method for incorporating solid additives in vinyl chloride polymers consisting of vinyl chloride and up to 30% by weight of a copolymerizable monomer, which comprises:

a. introducing the monomers to be polymerized into a first zone together with insoluble solid additives having a particle size within the range 0.01 – 20 μm and carrying out mass polymerization to a conversion up to 20%,

b. adding water and other water-soluble polymerization aids to the products of step a, and

c. carrying out suspension polymerization until the desired degree of conversion of the monomers has been obtained.

3,899,474

PROCESS FOR MANUFACTURING HYDROGENATED POLYMERS FROM CONJUGATED DIOLEFINS

Emmanuel Goldenberg, Poissy; Francois Dawans, Bougival; Jean-Pierre Durand, Rueil-Malmaison, and Germain Martino, Poissy, all of France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, France

Continuation-in-part of Ser. No. 267,523, June 29, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 428,046
Claims priority, application France, July 5, 1971, 71.24566
Int. Cl. C08d *5/02, 1/18, 3/04*
U.S. Cl. 260—94.3 **25 Claims**

1. A process for manufacturing hydrogenated polymers or copolymers from at least one conjugated diolefin, which comprises a first step of manufacturing an unsaturated polymer or copolymer by solution polymerizing the conjugated diolefin of 4–12 carbon atoms in contact with a catalytic quantity of a derivative of a transition metal carboxylate of the formula:

$$[(H_{3-n}X_n)C - CO_2M(R)_m \cdot (L)_p]_q$$

where *n* is 0, 1, 2 or 3, each X is a halogen atom, M is a transition metal of the groups IV to VIII of the periodic classification of the elements, each R is selected from the group consisting of a hydride ion, a halogen atom, a hydrocarbon radical and a carbonyl group, *m* is an integer from 1 to 4 inclusive, L is a Lewis base containing at least one ether, alcohol or ketone group, *p* is 0, 1 or 2 and *q* is an integer, in the absence of any metallic reducing agent and a second step, of hydrogenating the raw product from the first step, containing residual catalyst from this step, under a sufficient pressure of hydrogen in the additional presence of a sufficient quantity of a catalyst component consisting essentially of a metallic reducing agent, to form in situ a hydrogenation catalyst with said residual catalyst.

3,899,475

EXTREME PRESSURE LUBRICATION ADDITIVE

Bruce W. Hotten, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 24, 1972, Ser. No. 297,575
Int. Cl. C09f *1/00, 7/00*
U.S. Cl. 260—97.5 **5 Claims**

1. The composition of matter prepared by reacting (1) an unsaturated ester formed by the reaction of a C_1–C_{25} alkanol or alkenyl with a C_{10}–C_{25} fatty acid, (2) sulfur, and (3) a C_5–C_{18} dialkylphosphonate wherein the molar ratio of the reactants is about 1:1–2:0.1–0.5 and the reaction temperature is about 150°–180°C and reacted for a period of about 2–20 hours.

3,899,476

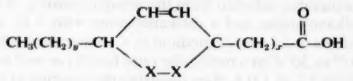
PROCESS FOR MAKING A METHACRYLIC ACID ADDUCT OF LINOLEIC ACID AND PRODUCT

Benjamin F. Ward, Isle of Palms, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 465,160
Int. Cl.² C09F *1/00, 7/02*
U.S. Cl. 260—97.5 **7 Claims**

1. A process for forming a cycloaliphatic C_{22}-dicarboxylic acid from a fatty acid mixture containing conjugated linoleic acid and non-conjugated linoleic acid comprising,

simultaneously reacting both the non-conjugated and conjugated linoleic acid portion of the fatty acid mixture with up to 30% by weight of said fatty acids, methacrylic acid and 0.01% to 0.50% by weight of said fatty acid mixture of iodine at a temperature between 250°C. and 260°C. to convert the conjugated and non-conjugated linoleic acid portion to a dicarboxylic acid having the formula



wherein *x* and *y* are integers from 3 to 9, *x* and *y* together equal 12, and one X is CH_2 and the other X is a $-C(CH_3)COOH$ group.

3,899,477

POLYMERIZATION OF ETHYLENE

Joseph M. Altemore, Dickinson, and Morris R. Ort, Seabrook, both of Tex., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 16, 1973, Ser. No. 333,250
Int. Cl. C08f *1/52*
U.S. Cl. 260—94.9 B **10 Claims**

1. In a process for producing polyethylene by bringing ethylene under polymerization conditions at low pressures in contact with a catalyst comprising a titanium halide, a vanadium halide and an organoaluminum compound, the improvement which comprises controlling the molecular weight distribution of said polyethylene by using a catalyst prepared by reacting said titanium halide, said vanadium halide and said organoaluminum compound in such proportions that the Al/(Ti + V) ratio is between about 0.1 and about 0.5 to form a catalyst complex and thereafter admixing said catalyst complex with a mixture of an alkylaluminum sesquialkoxide and a trialkylaluminum prior to contacting ethylene therewith.

3,899,478

BASIC AZO DYESTUFFS OF THE 2,6-DIAMINO-PYRIDINE SERIES

Erwin Fleckenstein, Hofheim, Taunus; Reinhard Mohr, Offenbach am Main, and Ernst Heinrich, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

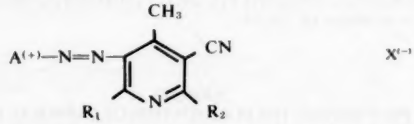
Filed May 2, 1973, Ser. No. 356,608

Claims priority, application Germany, May 5, 1972, 2222099

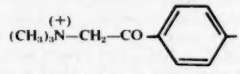
Int. Cl. C09b *29/36*

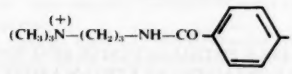
U.S. Cl. 260—156 7 Claims

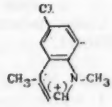
1. A basic azo dyestuff of the formula

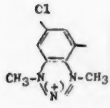


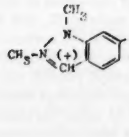
where $A^{(+)}$ is
trialkylammonium phenylene,



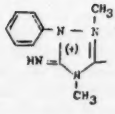








or



R_1 and R_2 each are methylamino, ethylamino, β-hydroxyethylamino or γ-methoxypropylamino, and $X^{(-)}$ is an anion.

3,899,479

2-(P-PHENYLAZOANILINO)QUINOLIZINIUM BROMIDE

Robert J. Alaimo, and Marvin M. Goldenberg, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Division of Ser. No. 278,618, Aug. 17, 1972, Pat. No. 3,880,868. This application Dec. 26, 1973, Ser. No. 431,141

Int. Cl.[2] A61K *31/435*; C07C *107/00*

U.S. Cl. 260—156 1 Claim

1. The compound 2-(p-phenylazoanilino)quinolizinium bromide.

3,899,480

SHAPED POLYSACCHARIDE ARTICLES AND A METHOD FOR PRODUCING THEM

Hiroshi Kimura, Kyoto; Kensuke Kusakabe, Osaka; Katsuhiko Tokuda, Osaka; Masaru Miyawaki, Osaka, and Hiromi Nakatani, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Dec. 29, 1971, Ser. No. 213,740

Claims priority, application Japan, Dec. 29, 1970, 45-128940

Int. Cl. C07g *3/00*

U.S. Cl. 260—209 R 2 Claims

1. A gelled polysaccharide selected from the group consisting of a gelled PS-A, PS-B and Curdlan which is produced by a process comprising: while maintaining a temperature not higher than 60°C throughout the process, dissolving 1 to 10% (weight/volume) of a PS-A, PS-B or Curdlan polysaccharide which is thermally gelable in a concentration of not lower than 1% (weight/volume) and mainly consists of β-1,3-glucose units, in a solution containing 0.05 to 5% (weight/volume) of a solubilizing agent selected from the group consisting of sodium hydroxide, potassium hydroxide and barium hydroxide; then decreasing the amount of said solubilizing reagent in the solution by diffusion, thereby allowing the polysaccharide to gel.

3,899,481

PROCESS FOR THE CONTROLLED PARTIAL DEGRADATION OF DEOXYRIBONUCLEIC ACID EXTRACTED FROM ANIMAL ORGANS

Adriano Butti, Como; Giuseppe Prino, Milan, and Gianfranco Bertellini, Maslianico, all of Italy, assignors to Crinos Industria Farmacobiologica S.A., Villa Guardia, Italy

Continuation-in-part of Ser. No. 194,917, Nov. 2, 1971, abandoned. This application Feb. 6, 1974, Ser. No. 440,269

Claims priority, application Italy, Nov. 3, 1970, 31308/70

Int. Cl.[2] C07H *21/04*

U.S. Cl. 260—211.5 R 10 Claims

1. A process for the partial degradation of deoxyribonucleic acid extracted from animal organs as alkali salts, said degradation being short of the formation of monomer nucleotides, comprising the steps of:

dissolving the alkali salt os deoxyribonucleic acid in water; heating the resultant solution at 50°–90° C. in the presence of a proton releasing substance selected from the group consisting of water soluble organic acids and cation exchange resins at a pH between 3.5 and 7 until the deoxyribonucleic acid is degraded to an extent that a 1% solution thereof in 0.5 molar sodium chloride will have a viscosity of greater than 1.05 centipoise and below 1.80 centipoise;

neutralizing the degraded solution, and precipitating the degraded solute by adding a liquid non-solvent to the degraded solute and inert to the components of the neutralized degraded solution.

3,899,482
2,2'-ANHYDRO-1-β-D-ARABINOFURANOSYL-5-FLUOROCYTOSINE SALTS AND PROCESS

Max Hoffer, Nutley, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sept. 5, 1972, Ser. No. 286,491
Int. Cl.[2] C07H *19/06*
U.S. Cl. 260—211.5 R **5 Claims**

1. A process for the preparation of a 2,2'-anhydro-1-beta-D-arabinofuranosyl-5-fluorocytosine hydrohalide selected from the group consisting of the hydrobromide, hydrofluoride and hydrochloride which process consists essentially of reacting 5-fluorocytidine with the Vilsmeier-Haack reagent (N,N'-dimethylformamide and an acid halide selected from the group consisting of thionyl chloride, -bromide or -fluoride and phosphorous oxychloride, -oxybromide or -oxyfluoride), said reagent being present in the concentration in the range of from about 3 to 6 mols per mol of 5-fluorocytidine and thereafter adding water or a C_1–C_7 lower alkanol in an amount not substantially exceeding the amount needed to decompose the said Vilsmeier-Haack reagent whereby said 2,2'-anhydro-1-beta-D-arabinofuranosyl-5-fluorocytosine hydrohalide is obtained in crystalline form directly from the reaction mixture.

3,899,483
PRODUCTION OF TEXTILE MATERIALS WITH IMPROVED FLAME RETARDANCE

Robert Bruce Le Blanc, Wickford, R.I., assignor to Cotton Incorporated, New York, N.Y.

Division of Ser. No. 307,796, Nov. 20, 1972, Pat. No. 3,827,907, which is a continuation-in-part of Ser. No. 220,453, Jan. 24, 1972, abandoned. This application Mar. 27, 1974, Ser. No. 455,311
Int. Cl. C08b *11/04, 27/70*
U.S. Cl. 260—231 A **2 Claims**

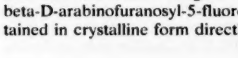
1. Titanated phosphonomethyl ether of cellulose.

3,899,484
FLUORINATED PHOSPHATES

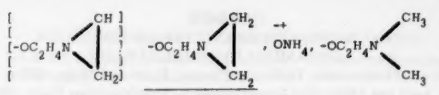
Gerald Joseph Walter, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 283,886, Aug. 25, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 459,144
Int. Cl. C07f *9/08;* **C07d** *105/04*
U.S. Cl. 260—239 EP **5 Claims**

1. A fluorinated phosphate of the structure



where x is 1–2 and Z is selected from the group consisting of Cl, OH, $—OC_2H_5$, $—OC_2H_4OH$,



$—NHC_2H_4OH$, and, where x is 1, both Z's together can represent

n is 1–12 and R_f is selected from the group consisting of $CF_3(CF_2)_y$, $(CF_3)_2CF(CF_2)_y$ and $(CF_3)_2CFO(CF_2)_y$ wherein y is an integer of 1 to 14.

3,899,485
PROCESS FOR THE PURIFICATION OF CAPROLACTAM

Otto Immel, and Hans Helmut Schwarz, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Jan. 23, 1973, Ser. No. 326,125
Claims priority, application Germany, Jan. 28, 1972, 2203945
Int. Cl. C07d *1/06*
U.S. Cl. 260—239.3 A **15 Claims**

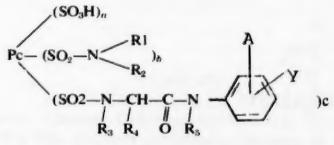
1. A process for the purification of impure solid ε-caprolactam which comprises extracting said lactam with a saturated solution of said lactam in a solvent for a period of up to 60 hours at a temperature of 0° to 50°C., said solvent being one in which said lactam has a solubility at 25°C. which is greater than 15 g of said lactam per 100 g of solvent.

3,899,486
WATER-SOLUBLE PHTHALOCYANINE REACTIVE DYESTUFFS CONTAINING AN ETHYLSULFONYL SUBSTITUENT

Jager Horst, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Dec. 31, 1969, Ser. No. 889,672
Claims priority, application Germany, Jan. 10, 1969, 1901041
Int. Cl. C07d *27/76*
U.S. Cl. 260—239.6 **9 Claims**

1. A phthalocyanine reactive dyestuff of the formula



in which Pc represents the radical of a phthalocyanine joined to the indicated substituents at the 3- or 4-position of different benzene rings of the phthalocyanine nucleus; R_1 and R_2 are hydrogen, or identical or different alkyls of 1–5 carbon atoms which are unsubstituted or are substituted by hydroxy, carboxy, sulfo, morpholino, cyclohexyl, benzyl, phenyl, naphthyl, and substituted phenyl and substituted naphthyl where the substituent is lower alkoxy, carboxy, or sulfo; R_3 stands for hydrogen or alkyl of 1–5 carbon atoms which is unsubstituted or substituted by hydroxy or sulfo; R_4 and R_5 represent hydrogen or lower alkyl radicals; A represents hydrogen, hydroxy, lower alkoxy, carboxy, sulfo, nitro, halo, or lower alkyl; Y represents a group $—SO_2—CH_2—CH_2—OSO_3H$, $—SO_2—CH=CH_2$ or $—SO_2—CH_2—CH_2—S—SO_3H$: a stands for 0, 1, 2, or 3, b for 0, 1, or 2, and c for 1, 2, 3, or 4, the sum total of a, b, and c not exceeding 4.

3,899,487
PHENYLSTILBENE TRIAZOLE COMPOUNDS

Fritz Fleck, Bottmingen, Basel, Switzerland; Alec Victor Mercer, Leeds; Roger Paver, Bradford, both of England, and Horst Schmid, Munchenstein, Basel, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

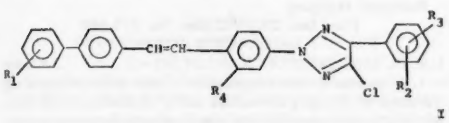
Filed Dec. 12, 1972, Ser. No. 314,333

Claims priority, application Switzerland, Dec. 17, 1971, 18433/71

Int. Cl. C09b *23/00*

U.S. Cl. 260—240 C **12 Claims**

1. A compound of the formula,



I

in which

R_1 signifies hydrogen, phenyl or the $-SO_3M$ group, in which M signifies the equivalent of a cation;

R_2 signifies hydrogen, nitrile, fluorine, chlorine, alkyl or alkoxy of 1 to 5 carbon atoms which may be substituted by hydroxyl, alkoxy of 1 to 4 carbon atoms; phenyl or phenoxy; or —COOM or $-SO_3M$, in which M is as defined above, —CONR′R″ or $SO_2NR'R''$, in which R′ and R″ each signifies hydrogen or alkyl of 1 to 4 carbon atoms;

R_3 signifies hydrogen; nitrile, fluorine, chlorine, alkyl or alkoxy of 1 to 5 carbon atoms which may be substituted by hydroxyl, alkoxy with 1 to 4 carbon atoms; phenyl or phenoxy, or phenyl which may be substituted by fluorine, chlorine, alkyl or alkoxy of 1 to 5 carbon atoms; cyano or the $-SO_3M$ group, in which M is as defined above, or —CONR′R″ or $-SO_2NR'R''$ in which R′ and R″ are as defined above; and

R_4 signifies hydrogen, nitrile; one of the groups —COOM; $-SO_3M$; in which M is as defined above, —CONR′R″ or $-SO_2NR'R''$, in which R′ and R″ are as defined above.

3,899,488
2H-INDAZOLONE COMPOUND

Herbert Oelschlager; Uwe Matthiesen, both of Frankfurt am Main, and Wilhelm A. Behrendt, Marburg, all of Germany, assignors to Firma Temmler-Werke, Marburg, Germany

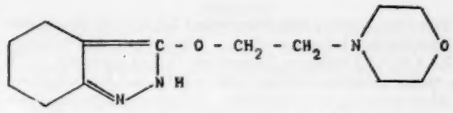
Division of Ser. No. 163,508, Aug. 16, 1971, abandoned. This application Feb. 9, 1973, Ser. No. 330,947

Claims priority, application Germany, July 17, 1970, 2035494; July 10, 1971, 2134592

Int. Cl.² C07D *231/00*

U.S. Cl. 260—247.5 EP **1 Claim**

1. 3(β-morpholino-ethoxy)-4,5,6,7-tetrahydro-2H-indazole as represented by the formula:



and the hydrobromide thereof.

3,899,489
HEXAHYDROTRIAZINONE DERIVATIVES

Gerhard Horlein, Frankfurt am Main; Peter Langeluddeke, Diedenbergen; Hubert Schonowsky, Neu-Isenburg, and Adolf Studeneer, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

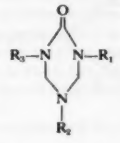
Filed Apr. 30, 1973, Ser. No. 355,915

Claims priority, application Germany, May 4, 1972, 2221787

Int. Cl.² C07D *251/06*

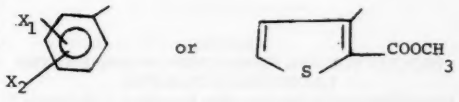
U.S. Cl. 260—248 NS **14 Claims**

1. Hexahydrotriazinone compound of the formula



in which R_1 and R_2 each are alkyl having 1 - 4 carbon atoms or alkenyl having 3 to 4 carbon atoms,

R_3 represents



in which X_1 is fluoroalkoxy- or fluoroalkylthio having 1 – 3 carbon atoms and containing 2 to 6 fluorine atoms, or halogenated vinyloxy,

X_2 is hydrogen, halogen, $-CH_3$, $-CF_2Cl$ or CF_3.

3,899,490
HEXAHYDRO PYRAZINOQUINOLINES

Hugh C. Richards, Canterbury, England, assignor to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 789,610, Jan. 7, 1969, abandoned. This application Dec. 5, 1973, Ser. No. 422,087

Claims priority, application United Kingdom, Jan. 12, 1968, 1853/68; Aug. 2, 1968, 36884/68

Int. Cl.² C07D *295/08*

U.S. Cl. 260—268 TR **3 Claims**

1. A hexahydro pyrazinoquinoline compound selected from the group consisting of 7-nitro-8-hydroxymethyl-2,3,4,4a,5,6-hexahydro-1H-pyrazino-[1,2-a]-quinoline, 8-hydroxymethyl-9-nitro-2,3,4,4a,5,6-hexahydro-1H-pyrazino-[1,2-a]-quinoline, 3-n-propyl-8-hydroxymethyl-9-nitro-2,3,4,4a,5,6-hexahydro-1H-pyrazino-[1,2-a]-quinoline, 3-isopropyl-8-hydroxymethyl-9-nitro-2,3,4,4a,5,6-hexahydro-1H-pyrazino-[1,2-a]-

quinoline, 7-chloro-8-hydroxymethyl-2,3,4,4a,5,6-hexahydro-1H-pyrazino-[1,2-a]-quinoline, 8-hydroxy-methyl-9-chloro-2,3,4,4a,5,6-hexahydro-1H-pyrazino-[1,2-a]-quinoline, 3-methyl-8-hydroxymethyl-9-chloro-2,3,4,4a,5,6-hexahydro-1H-pyrazino-[1,2-a]-quinoline, 8-hydroxymethyl-9-chloro-10-methyl-2,3,4,4a,5,6-hexahydro-1H-pyrazino-[1,2-a]-quinoline and 3-n-propyl-8-hydroxymethyl-9-chloro-2,3,4,4a,5,6-hexahydro-1H-pyrazino-[1,2-a]-quinoline.

3,899,491

ALKYL ALKANOATE DERIVATIVES OF SUBSTITUTED PIPERAZINES AND POLYMER COMPOSITIONS STABILIZED THEREBY

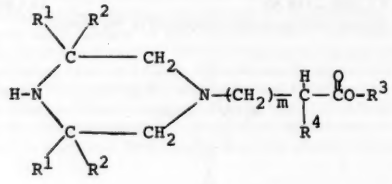
Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 239,350, March 29, 1972, abandoned. This application Feb. 15, 1973, Ser. No. 332,839

Int. Cl. C07d *51/72*

U.S. Cl. 260—268 TR **15 Claims**

1. A compound of the formula



wherein,

R^1 and R^2 are methyl or together with the carbon to which they are bound are cyclopentyl or cyclohexyl;

R^3 is alkyl of from 1 to 20 carbon atoms;

R^4 is hydrogen or methyl, and m is 0 or 1.

3,899,492

PROCESS FOR THE PRODUCTION OF SUBSTITUTED 1,2-DIHYDROQUINOLINES

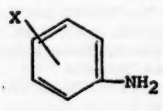
Leonard Sergeevich Povarov, ulitsa Krasikova, 7/43, korpus 3, kv.28, and Boris Mikhailovich Mikhailov, ulitsa Vavilova, 55, kv.85, both of Moscow, U.S.S.R.

Continuation of Ser. No. 834,860, June 19, 1969, abandoned. This application Oct. 17, 1972, Ser. No. 298,280

Int. Cl. C07d *33/18*

U.S. Cl. 260—283 SY **10 Claims**

1. A process for the production of 2,2,4-trimethyl-1,2-dihydroquinolines or benzoquinolines which consists of reacting 3-naphthylamine or an aniline of the formula



wherein X is in the 3 or 4 position and is selected from the group consisting of primary or secondary alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen or phenyl, with an isopropenyl ether of the formula

wherein R is primary alkyl of 1 to 5 carbon atoms in the presence of a catalyst selected from the group consisting of $AlBr_3$ and $BF_3.O(C_2H_5)_2$ and a solvent selected from the group consisting of benzene, ethyl acetate and chloroform.

3,899,493

CHROMIC ACID OXIDATION OF VINBLASTINE SULFATE TO FORM VINCRISTINE

Karolina Jovanovics; Kálmán Szász; György Fekete; Emil Bittner; Eszter Dezséri, and János Éles, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

Filed Dec. 29, 1972, Ser. No. 319,468

Int. Cl.² C07D *459/00*

U.S. Cl. 260—287 P **3 Claims**

1. A process for the preparation of vincristine, comprising the steps of oxidizing the sulfate salt of vinblastine with chromic acid in an organic solvent selected from the group consisting of acetic acid and mixtures of glacial acetic acid and acetone at a temperature of about −60°C, adjusting the reaction mixture to a pH of 7–9 and recovering the vincristine.

3,899,494

SUBSTITUTED 6-PHENYL BENZO-NAPHTHYRIDINES

Hans Ott, Pfeffingen, and Rudolf Suess, Bettingen, both of Switzerland, assignors to Sandoz Ltd., Basle, Switzerland

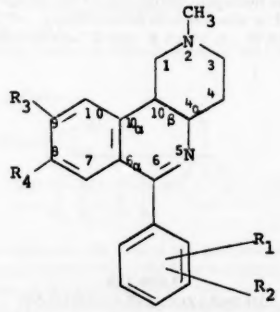
Continuation-in-part of Ser. No. 305,289, Nov. 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 303,069, Nov. 2, 1972, abandoned, which is a continuation of Ser. No. 140,239, May 4, 1971, abandoned. This application Oct. 19, 1973, Ser. No. 408,053

Claims priority, application Switzerland, May 13, 1970, 7086/70; May 13, 1970, 7089/70; Oct. 26, 1972, 15675/72; Oct. 26, 1972, 15676/72; Oct. 26, 1972, 15677/72; Oct. 26, 1972, 15678/72

Int. Cl. C07d *35/10*

U.S. Cl. 260—287 R **70 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen, alkyl of one to three carbon atoms, alkoxy of one to three carbon atoms or alkylthio of one to three carbon atoms, fluorine, bromine, chlorine, nitro, trifluoromethyl, amino or —NH—CO—R

wherein —CO—R is alkanoyl of 1 to 18 carbon atoms, benzoyl, benzoyl wherein the benzene ring is substituted by one X and one Y, X being lower alkyl of one to four carbon atoms, lower alkoxy of one to four carbon atoms, fluorine, chlorine, or bromine, and Y being hydrogen,

lower alkyl of one to four carbon atoms, lower alkoxy of one to four carbon atoms, or chlorine, phenyl-alkenoyl, wherein the alkylene section has one to three carbon atoms, cinnamoyl, phenyl-alkenoyl as defined above or cinnamoyl which are substituted in the benzene ring by one X and one Y which are as defined above, or A—CO—, A being thienyl, furyl, pyrrolyl, or pyridyl

R_2 is hydrogen, chlorine, alkyl of one to three carbon atoms or alkoxy of one to three carbon atoms, and

R_3 and R_4 are both hydrogen or both methoxy, or

R_3 and R_4 together are methylenedioxy,

or a pharmaceutically acceptable acid addition salt thereof.

3,899,495

PROCESS FOR THE PRODUCTION OF 2,6-DICHLOROPYRIDINE

Helmut Beschke; Hans Schaefer, both of Grossauheim, and Wilhelm Alfons Schuler, Bad Homburg, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed Jan. 22, 1973, Ser. No. 325,834

Claims priority, application Germany, Feb. 21, 1972, 2208007

Int. Cl. C07d *31/26*

U.S. Cl. 260—290 HL **9 Claims**

1. A process for preparing 2,6-dichloropyridine from pyridine and chlorine comprising carrying out the reaction in the presence of steam at a temperature between 370° and 440°C. employing 8 to 14 moles of steam and 2 to 3.5 moles of chlorine per mole of pyridine cooling the reaction product and dissolving it in an aromatic hydrocarbon.

3,899,496

PRODUCTION OF 1-AMINOALKANE-1,1-DIPHOSPHONIC ACIDS

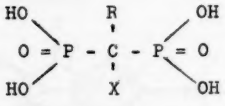
Norbert Schindler, Monheim-Baumberg, and Walter Ploger, Hilden Rhld., both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Germany

Continuation of Ser. No. 184,635, Sept. 28, 1971, abandoned. This application Nov. 21, 1973, Ser. No. 417,710

Int. Cl. C07d *295/04*

U.S. Cl. 260—293.51 **11 Claims**

1. A process for the production of 1,1-diphosphonic acids of the formula



in which R represents a member selected from the group consisting of hydrogen, alkyl with 1 to 12 carbon atoms, phenyl, cyclohexyl, phenylalkyl with 7 to 12 carbon atoms, piperidinyl, carboxyalkyl with 2 to 12 carbon atoms, and carbalkoxy alkyl with 3 to 12 carbon atoms; and in which X represents a member selected from the group consisting of NH_2, piperidino, morpholino and NR_1R_2, wherein R_1 and R_2 represent alkyl with 1 to 4 carbon atoms, consisting of reacting the corresponding amide dihalide compounds of the formula selected from the group consisting of $RCCl_2X$ and $RCBr_2X$, wherein R and X have the above-assigned meanings, with phosphorous acid; and recovering said 1,1-diphosphonic acids.

3,899,497

PREPARATION OF 3-QUINUCLIDINYL BENZILATE

Jacob I. Miller; Gaston E. Dudley, both of Baltimore, Md.; Philip A. Blackwell, Jr., Cleveland, Miss., and Omer O. Owens, Edgewood, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 26, 1962, Ser. No. 183,337

Int. Cl.² C07D *211/00*

U.S. Cl. 260—293.53 **5 Claims**

1. A method for the preparation of 3-quinuclidinyl benzilate which comprises reacting methyl benzilate with 3-quinuclidinol in an inert anhydrous aliphatic hydrocarbon solvent in the presence of 7–15 molar percent of metallic sodium based on the methyl benzilate.

3,899,498

QUINUCLIDINE-2-CARBOXALDEHYDES

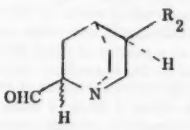
Guenter Grethe, North Caldwell, and Milan Radoje Uskokovic, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 166,583, July 27, 1971, Pat. No. 3,823,146, which is a continuation-in-part of Ser. No. 117,131, Feb. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 20,034, March 16, 1970, abandoned. This application May 2, 1974, Ser. No. 466,356

Int. Cl.² C07D *453/02*

U.S. Cl. 260—293.53 **5 Claims**

1. An epimeric compound of the formula



wherein R_2 is ethyl or vinyl, and enantiomers and racemates thereof.

3,899,499

MANUFACTURE OF BIPYRIDYLIUM SALTS

John Edward Colchester, and Thomas Blundell, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 833,709, June 16, 1969, Pat. No. 3,790,585. This application Jan. 21, 1974, Ser. No. 435,167

Claims priority, application United Kingdom, July 1, 1968, 31365/68; Sept. 11, 1968, 43147/68; Oct. 8, 1968, 47585/68; Nov. 1, 1968, 51850/68; Nov. 23, 1968, 61012/68; Feb. 17, 1969, 8509/69

Int. Cl.² C07D *213/22*

U.S. Cl. 260—295 AM **26 Claims**

1. A process for the manufacture of a dihydrobipyridyl which is oxidizable to a 1,1′-disubstituted-4,4′-bipyridylium salt wherein each 1-substituent is an alkyl or carbamidoalkyl of up to 10 carbon atoms consisting essentially of reacting the corresponding 1-substituted pyridinium salt under basic conditions with soluble cyanide in the presence of a protic solvent which is an alkanol.

3,899,500

MANUFACTURE OF BIPYRIDYLIUM SALTS

John Edward Colchester, and Thomas Blundell, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 833,709, June 16, 1969, Pat. No. 3,790,585. This application Jan. 21, 1974, Ser. No. 435,168

Claims priority, application United Kingdom, July 1, 1968, 31365/68; Sept. 11, 1968, 43147/68; Oct. 8, 1968, 47585/68; Nov. 1, 1968, 51850/68; Nov. 23, 1968, 61012/68; Feb. 17, 1969, 8509/69

Int. Cl.[2] C07D *213/22*

U.S. Cl. 260—295 AM 33 Claims

1. A process for the manufacture of a dihydrobipyridyl which is oxidizable to a 1,1′-disubstituted-4,4′-bipyridylium salt wherein each 1-substituent is an alkyl or carbamidoalkyl of up to 10 carbon atoms consisting essentially of reacting the corresponding 1-substituted pyridinium salt with soluble cyanide in the presence of a protic solvent and an added alkali metal base or ammonium base.

3,899,501

CONTINUOUS SACCHARIN PROCESS

Francis Huba, and Robert G. Banner, both of Painesville, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 52,363, July 6, 1970, abandoned. This application Feb. 8, 1973, Ser. No. 330,737

Int. Cl.[2] C07D *275/06*

U.S. Cl. 260—301 4 Claims

1. A continuous process for producing saccharin of improved quality which comprises

a. adding o-toluenesulfonamide, a hexavalent chromium compound, sulfuric acid and water simultaneously and continuously to a reactor at ratios of from about 0.8 to about 4 moles of the hexavalent chromium compound, from about 2 to about 20 moles of the acid, and from about 0.04 to about 2 liters of water per mole of the o-toluenesulfonamide to provide continuous production of reaction products of the o-toluenesulfonamide and the chromium compound,

b. a continuously reacting together the o-toluenesulfonamide and the chromium compound in the presence of the acid in the reactor at a temperature of from about 30° to about 70°C. over a means residence time of from about 0.2 to about 4 hours,

c. continuously removing sufficient reaction mixture from the reactor to maintain a constant volume in the reactor,

d. cooling and separating crude saccharin, trivalent chromium compound liquor, and unreacted o-toluenesulfonamide from the reaction mixture removed from the reactor,

e. returning the unreacted o-toluenesulfonamide to step (a), and

f. recovering the saccharin and the trivalent chromium as individual reaction products.

3,899,502

1,2,4-THIADIAZOL-3,5-DIYL-SULFENAMIDES

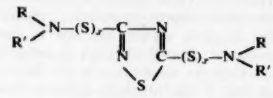
Marion W. Harman, Dunbar, W. Va., assignor to Monsanto Company, St. Louis, Mo.

Filed May 14, 1973, Ser. No. 359,978

Int. Cl. C07d *91/60*

U.S. Cl. 260—302 SD 7 Claims

1. A compound of the formula



in which x is one or two, R and R′ independently are hydrogen, alkyl of 1–8 carbon atoms, aralkyl of 7–10 carbon atoms, cycloalkyl of 5–8 carbon atoms, or R and R′ together with the nitrogen atom form pyrrolidinyl, 2,5-dimethylpyrrolidinyl, piperidino, 4-methylpiperidino, 2,6-dimethylpiperidino, 2,4-6-trimethylpiperidino, 2-ethylpiperidino, morpholino, thiomorpholino, 2,6-dimethylmorpholino, hexahydro-1H-azepin-1-yl or azabicyclo(3.2.2)non-3-yl.

3,899,503

PROCESS FOR PREPARING 2-(2′)-FURYL-, 2-(2′)-THIENYL-2-(4′)-THIAZOLYL-OR 2-(2′)-PYRRYL-5 (OR 6) NITROBENZIMIDAZOLE

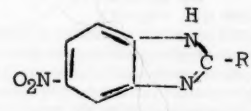
Robert J. Alaimo, and Ronald J. Storrin, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jan. 25, 1974, Ser. No. 436,462

Int. Cl.[2] C07D *235/18*

U.S. Cl. 260—302 H 1 Claim

1. A process for preparing a compound of the formula:



wherein R is 2-furyl, 2-thienyl, 4-thiazolyl or 2-pyrryl, which consists in reacting an aldehyde selected from the group consisting of furfural, thienaldehyde, thiazolealdehyde and pyrrole aldehyde with 4-nitro-o-phenylenediamine in the presence of benzoquinone.

3,899,504

CERTAIN BENZAZOLYLAMINO-ANTHRAQUINONES

Diether Wessling; Heinrich Leister, both of Cologne, and Eberhart Degener, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

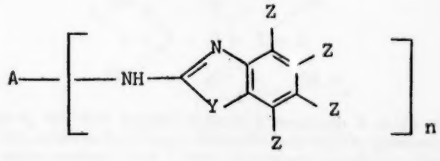
Filed Dec. 3, 1971, Ser. No. 204,722

Claims priority, application Germany, Dec. 4, 1970, 2059724

Int. Cl. C07d *91/34*, *85/48*

U.S. Cl. 260—303 3 Claims

1. Dyestuff free of sulfonic acid groups of the general formula



wherein

A denotes anthraquinone or anthraquinone substituted by 1 to 3 substituents selected from the group consisting of hydroxyl, chlorine, amino, methoxy or anilino,

Y denotes S or O,

Z denotes chlorine or bromine,

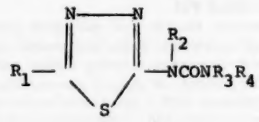
n denotes 1 or 2 and wherein the tetrahalobenzazolylamino groups are attached to the α-positions of the anthraquinone nucleus.

3,899,505
METHOD OF PRODUCING 1,3,4-THIADIAZOL-2-YLUREAS

Tony Cebalo, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 19, 1970, Ser. No. 4,075
Int. Cl. C07d *91/62*
U.S. Cl. 260—306.8 D **6 Claims**

1. A method for producing 1,3,4-thiadiazol-2-ylurea compounds having the general structure:



wherein

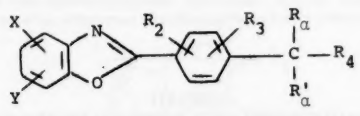
R_1 is a lower alkyl radical having from 1 to 4 carbon atoms, a fluoroalkyl radical having from 1 to 4 carbon atoms, and R_2, R_3 and R_4 are lower alkyl radicals having from 1 to 4 carbon atoms, which comprises reacting a 2-alkylamino-1,3,4-thiadiazole compound with an N,N-dialkylcarbamoyl chloride compound in the presence of a sodium metalating agent, the reaction being conducted at a temperature in the range of from about −5°C to about +15°C.

3,899,506
4-(BENZOXAZOL-2-YL)-PHENYLACETIC ACIDS AND DERIVATIVES THEREOF

Tsung-Ying Shen, Westfield; Conrad P. Dorn, Jr., Plainfield, both of N.J., and Jorge P. Li, Brown Deer, Wis., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 165,389, July 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 71,227, Sept. 10, 1970, abandoned. This application Aug. 16, 1973, Ser. No. 388,852
Int. Cl.[2] C07D *263/56*
U.S. Cl. 260—307 D **10 Claims**

1. A compound of formula:



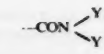
or pharmaceutically acceptable salt thereof, wherein

R_α is hydrogen or methyl;

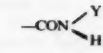
R'_α is hydrogen, or R_α and R'_α taken together can be methylene; or R'_α is a methylene linkage attached to the unsubstituted ortho position of the benzenoid ring;

X, Y, R_2 and R_3 are the same or different and each is hydrogen, C_{1-3} alkyl, chloro, bromo, or fluoro;

R_4 is —COOH,
—COOR where R is C_{1-5} alkyl,
$-CONH_2$,



or



where Y is C_{1-3} alkyl

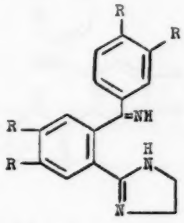
with the proviso that R_α, R'_α, R_2, R_3, X and Y cannot be all hydrogen when R_4 is —COOH.

3,899,507
PROCESS FOR PREPARING IMIDAZO-[2,1-A]ISOINDOLES

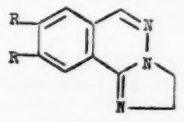
Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed July 30, 1973, Ser. No. 384,035
Int. Cl. C07d *49/36*
U.S. Cl. 260—309.6 **6 Claims**

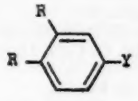
1. A process for preparing a compound of the formula



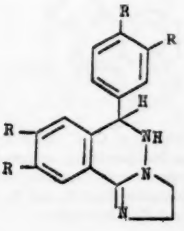
which comprises treating a compound of the formula



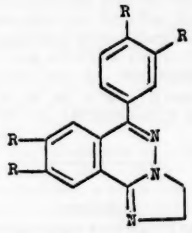
with a compound of the formula



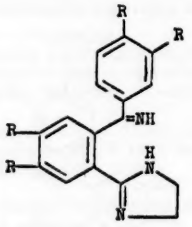
in organic solvent at a temperature of about −40° to +50°C., and hydrolyzing the resulting product to obtain a compound of the formula



oxidizing the latter in strong oxidizing agent which is manganese dioxide, aqueous potassium permanganate or 2,3-dichloro-5,6-dicyano-benzoquinone in inert solvent at about 0° – 150°C. to obtain a compound of the formula



and reducing the latter with mild reducing agent which is (a) zinc, acetic acid and hydrochloric acid, or (b) Raney nickel and hydrogen to obtain a compound of the formula



where each

R, independently, represents H or halo having an atomic weight of about 19–36, and

Y represents MgX or Li, and

X is halo of atomic weight about 35–80.

3,899,508

5-(2-AMINOPHENYL)PYRAZOLE-3-CARBOXYLIC ACIDS AND ESTERS THEREOF

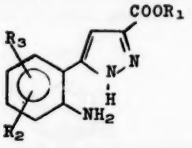
James H. Wikel, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 12, 1974, Ser. No. 460,646

Int. Cl. C07d *47/02*

U.S. Cl. 260—310 R **2 Claims**

1. A compound of the formula,



wherein R_1 is hydrogen or C_1–C_3 alkyl and R_2 and R_3 are monovalent groups independently selected from the group consisting of hydrogen, methyl, methoxy, fluoro, chloro, and bromo, with the limitation that R_2 and R_3 must be different unless each of R_2 and R_3 is hydrogen.

3,899,509

PROCESS FOR THE MANUFACTURE OF MALEIC ACID IMIDE

Wilhelm Riemenschneider, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 622,399, March 13, 1967, abandoned. This application Nov. 12, 1970, Ser. No. 89,056

Claims priority, application Germany, Mar. 25, 1966, 48773; Dec. 23, 1966, 51057

Int. Cl.² C07D *207/40*

U.S. Cl. 260—326.5 FM **5 Claims**

1. A continuous, recycle type gas phase process for the manufacture of maleic acid imide from maleic anhydride and ammonia which comprises reacting maleic anhydride with ammonia in the presence of an inert gaseous diluent at superatmospheric pressure with a substantial molar deficiency of ammonia to maleic anhydride in the presence of an aluminum oxide catalyst and with relatively low conversions per pass in the range of from 5 to 20 %.

3,899,510

CYCLOALKYLAMINO COMPOUNDS

John William Lewis, North Ferriby, and Michael John Readhead, North Hull, both of England, assignors to Reckitt & Colman Products Limited, Hull, England

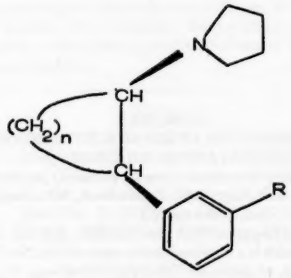
Filed June 4, 1973, Ser. No. 366,609

Claims priority, application United Kingdom, June 7, 1972, 26602/72

Int. Cl.² C07D *27/00*

U.S. Cl. 260—326.5 M **9 Claims**

1. Compounds of the general formula:



I

wherein *n* is an integer from 3 to 5 inclusive, R is selected from the group consisting of hydroxy, amino, dimethylamino and OR^1 wherein R^1 is selected from the group consisting of acetyl, propionyl, butyryl, carbamoyl, methylcarbamoyl and dimethylcarbamoyl; and pharmaceutically acceptable salts thereof.

3,899,511

PHOTOGRAPHIC PROCESSES AND PRODUCTS EMPLOYING BENZINDOLE PHTHALEINS AS OPTICAL FILTER AGENTS

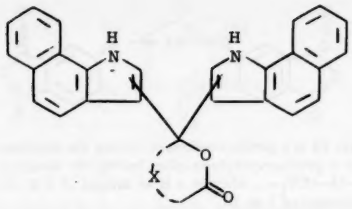
Stanley M. Bloom, Waban, and Paulina P. Garcia, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

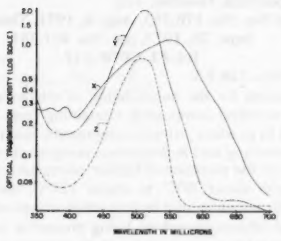
Division of Ser. No. 176,053, Aug. 30, 1971, Pat. No. 3,779,752. This application Aug. 30, 1973, Ser. No. 393,133

Int. Cl.² C07D *209/18*

U.S. Cl. 260—326.13 **11 Claims**

1. A symmetrical di-benzindolyl indicator dye having the formula





wherein X represents the atoms necessary to complete a ring-closing moiety selected from phthalide, 7-carboxyphthalide and naphthalide, said benzindolyl radicals being selected from benzindol-2-yl radicals and benzindol-3-yl radicals.

3,899,512

BENZOXEPIN DERIVATIVES

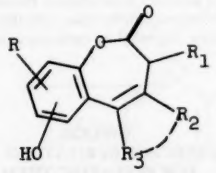
Jules Freedman, Thiensville, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 339,057, March 8, 1973, abandoned. This application Apr. 22, 1974, Ser. No. 462,604

Int. Cl.[2] C07D *313/10*

U.S. Cl. 260—343.2 R **10 Claims**

1. A compound of the following formula:



in which R is hydrogen or an alkyl of 1 to 9 carbon atoms, and R_1 is hydrogen, a lower alkyl of 1 to 4 carbon atoms or phenyl, R_2 and R_3 are hydrogen, lower alkyl of 1 to 4 carbon atoms, phenyl, halophenyl, dihalophenyl, dimethylphenyl, and alkoxyphenyl, or a heterocyclic group selected from nicitinoyl and thenoyl, or R_2 and R_3 are joined together by an alkylidene chain to form cyclohexyl or methyl-cyclohexyl.

3,899,513

1-(2-SUBSTITUTED-CHROMONYLOXY)-2-HYDROXY-3-(SUBSTITUTED-PHENOXY)PROPANES

Brian Thomas Warren, Ickenham, and John William Spicer, London, both of England, assignors to Miles Laboratories, Inc., Elkhart, Ind.

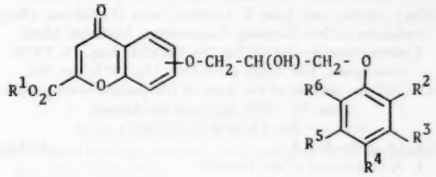
Filed Jan. 2, 1973, Ser. No. 320,600

Claims priority, application United Kingdom, Jan. 14, 1972, 1912/72

Int. Cl. C07d *311/02, 311/72*

U.S. Cl. 260—345.2 **10 Claims**

1. A compound having the formula



wherein:

R^1 is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, and a nontoxic pharmaceutically acceptable cation;

each of R^2, R^3, R^5, and R^6 is hydrogen; and,

R^4 is cyano.

3,899,514

NOVEL SPIRODIPYRANS AND CHROMOGENIC MATERIALS FOR COPYING PROCESSES

Hans Baumann, Ludwigshafen, and Andreas Oberlinner, Mannheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

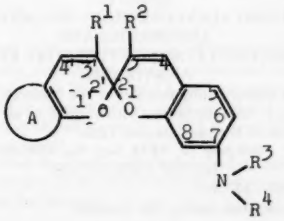
Filed June 28, 1973, Ser. No. 374,353

Claims priority, application Germany, July 1, 1972, 2232364

Int. Cl. C07d *7/26*

U.S. Cl. 260—345.2 **4 Claims**

1. A spirodipyran of the formula:



in which,

A is a benzene or naphthalene nucleus optionally substituted by one chlorine atom, one bromine atom, or one carbomethoxy or one carbethoxy group,

R^1 is methyl or isopropyl,

R^2 is hydrogen, or R^1 and R^2 together form a trimethylene radical, and

R^3 and R^4 are methyl, ethyl or propyl.

3,899,515

METHYL-5-(TRIMETHOXY SILYL PROPYLTHIO) NORBORNANE-2,3-DICARBOXYLIC ANHYDRIDE

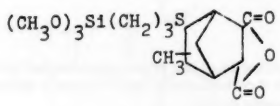
John L. Speier, and Gary E. LeGrow, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 66,134, Aug. 21, 1970, abandoned. This application Dec. 10, 1973, Ser. No. 423,322The portion of the term of this patent subsequent to June 14, 1988, has been disclaimed.

Int. Cl.[2] C07D *307/89*

U.S. Cl. 260—346.3 **1 Claim**

1. A compound of the formula



3,899,516

OXIDATION OF BUTANE TO MALEIC ANHYDRIDE USING BUTANE-RICH FEED

Alan F. Dickason, Chester, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Filed Oct. 17, 1973, Ser. No. 407,347

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.8 A **12 Claims**

1. In a process for the catalytic vapor phase oxidation of butane to form maleic anhydride, the improvement wherein the oxidant is substantially pure oxygen, the ratio of butane to oxygen is greater than about 1:4, and the catalyst is a vanadium-phosphorus catalyst containing a third metal component selected from the group consisting of calcium, barium, and magnesium.

3,899,517

PERFLUORO ALKYLENE DIOXY-BIS-(4-PHTHALIC ANHYDRIDES AND OXY-BIS-(PERFLUOROALKYLENEOXY-PHTHALIC ANHYDRIDES

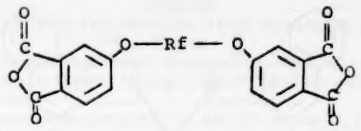
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and James A. Webster, Dayton, Ohio

Filed July 16, 1974, Ser. No. 489,008

Int. Cl.[2] C07D *307/89*

U.S. Cl. 260—346.3 **7 Claims**

1. A dianhydride having the formula:



wherein Rf is a perfluoroalkylene having the structure $—CF_2—_n$ or a perfluoroalkylene ether having the structure $—CF_2—_m—O—(CF_2—_m$ wherein n is an integer of 2 to 10, and m is an integer of 1 to 10.

3,899,518

PREPARATION OF OXIRANE COMPOUNDS BY AUTOXIDATION

Bruno J. Barone, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 170,283, Aug. 9, 1971. This application Sept. 28, 1973, Ser. No. 401,781

Int. Cl. C07d *1/12*

U.S. Cl. 260—348.5 V **8 Claims**

1. A process for the autoxidation of ethylenically unsaturated hydrocarbon compounds containing from 2 to 30 carbon atoms to produce oxirane compounds, said process comprising contacting said hydrocarbon compounds with molecular oxygen in the presence of lithium phosphate at a temperature of from about 70°C. to about 120°C. and a pressure sufficient to maintain said hydrocarbon compounds in liquid phase, said lithium phosphate being present in an amount of from about 0.05 to about 0.8 weight percent based on said hydrocarbon compounds.

3,899,519

6-ARYLTHIO-1, 4,5-TRIHYDROXYANTHRAQUINONES

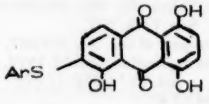
Edgar E. Renfrew, Lock Haven, and Raouf Botros, Beech Creek, both of Pa., assignors to American Aniline Products, Inc., Paterson, N.J.

Filed June 14, 1973, Ser. No. 370,041

Int. Cl. C09b *1/02, 1/14*

U.S. Cl. 260—383 **3 Claims**

1. A compound of the formula



wherein Ar is phenyl which is unsubstituted or substituted by a member selected from chloro, bromo, lower alkyl of 1–4 carbon atoms, methylthio, ethylthio, methoxy, ethoxy and nitro; naphthyl or methoxynaphthyl.

3,899,520

STANNOUS CATECHOL DERIVATIVES AND PROCESS FOR PREPARING THEM

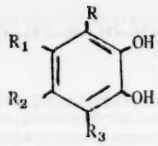
Bruce G. van Leuwen and James J. Pitts, both of Hamden, Conn., assignors to Olin Corporation, New Haven, Conn.

Filed July 2, 1973, Ser. No. 375,396

Int. Cl. C07c *69/00*

U.S. Cl. 260—414 **13 Claims**

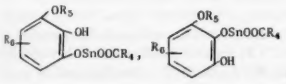
1. A process for preparing stannous catechol derivatives which comprises reacting, in the presence of an inert organic solvent, a catechol of the formula:



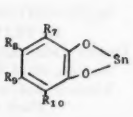
wherein each of R, R_1, R_2, and R_3 is independently selected from the group consisting of hydrogen, halogen, nitro, alkyl having 1 to about 10 carbon atoms and alkoxy having 1 to about 10 carbon atoms, with a stannous carboxylate of the formula:

$$(R_4COO)_2\,Sn \qquad II$$

to produce a stannous catechol derivative selected from the group consisting of:



and



wherein R_4 is selected from the group consisting of hydrogen, alkyl having 1 to about 9 carbon atoms and alkenyl having 1 to about 9 carbon stoms,

R_5 represents alkyl having from 1 to about 10 carbon atoms,

R_6 represents hydrogen, halogen, nitro or alkyl having 1 to about

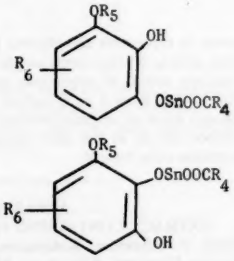
10 carbon atoms, and

each of R_7, R_8, R_9, and R_{10} independently represents hydrogen,

halogen, nitro and alkyl having 1 to about 10 carbon atoms.

9. A stannous catechol derivative represented by the formula selected from

and



wherein, as applied to each of said formulas, R_4 is selected from the group consisting of hydrogen, alkyl having from 1 to about 9 carbon atoms and alkenyl having from 1 to about 9 carbon atoms, R_5 represents an alkyl having from 1 to about 10 carbon atoms, and R_6 is selected from the group consisting of hydrogen, halogen, nitro or alkyl having from 1 to about 10 carbon atoms.

3,899,521

COMPLEX COMPOUNDS OF ASPARTIC ACID WITH A RARE EARTH METAL AND ZINC

Walter Evers, Siemensstrasse 4, 2080 Pinneberg, Germany

Filed Dec. 14, 1973, Ser. No. 425,060

Int. Cl.[2] **C07F** *3/06, 5/00*

U.S. Cl. 260—429.2 **6 Claims**

1. A complex compound of aspartic acid with a rare earth and zinc.

3,899,522

TRIVALENT ANTIMONY CATALYST

Otto Ernest Loeffler, Rahway, N.J., assignor to NL Industries, Inc., New York, N.Y.

Filed Aug. 24, 1973, Ser. No. 391,121

Int. Cl. C07f *9/90*

U.S. Cl. 260—414 **9 Claims**

1. A trivalent antimony catalyst having the valences of antimony occupied by dianion radical of a 1,2-alkane diol and organic carboxylate anion radical, said carboxylate anion radical contianing from 1 to 10 carbon atoms, wherein the molar ratio of antimony to dianion radical of 1,2-alkane diol to organic carboxylate anion radical is 1:1:1, and wherein said dianion radical of a 1,2-alkane diol is selected from the group consisting of ethylene glycol dianion, 1,2-propane diol dianion, 3-chloro-1,2-propane diol dianion, 1,2-butane diol dianion, and mixtures thereof.

3,899,523

SILACYCLOPROPANES AND METHOD

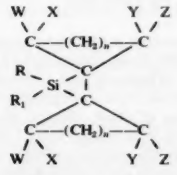
Dietmar Seyferth, Lexington, Mass., and Robert L. Lambert, Jr., St. Paul, Minn., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 28, 1973, Ser. No. 419,502

Int. Cl. C07b *7/08*

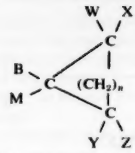
U.S. Cl. 260—448.2 D **14 Claims**

1. A silacyclopropane of the formula:



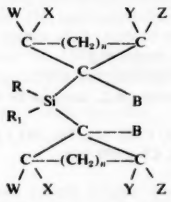
wherein R and R_1 can be the same or different and are hydrogen, alkyl, aryl, substituted alkyl or substituted aryl; n is an integer from 0 to 10; W, X, Y and Z are hydrogen, alkyl, aryl, substituted alkyl, substituted aryl or W and X and Y and Z on the same ring constituent can be $-(CH_2)_m-$ wherein m is an integer from 1 to 10.

8. The process for forming the compound of claim **1** which comprises reacting in the absence of oxygen and moisture a compound of the formula:



wherein M is lithium or $—M_gBr$ and B is bromo or chloro with a compound of the formula:

wherein A and A_1 are halogen substituents to form a first product of the formula:



and reacting said first product with zinc or magnesium to remove the substituents, B and wherein any substituents of R, R_1, W, X, Y and Z are inert under the conditions maintained during said reacting steps.

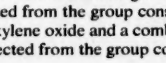
3,899,524

COMPLEX ORGANO SILICON COMPOUNDS

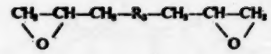
Kevin M. Foley, Hebron, and Francesco M. Vigo, Heath, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 2, 1973, Ser. No. 347,264
Int. Cl. C07f 7/18
U.S. Cl. 260—448.8 R **49 Claims**

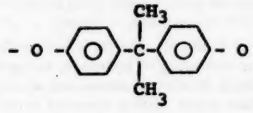
1. Organo silicon compounds prepared by reaction of (1) a halosilane selected from the group consisting of a silane of the formula SiX_4 wherein X is halogen, and a compound of the formula $(R_7)_nSiX_{(4-n)}$ wherein R_7 is an organic group selected from the group consisting of alkyl, alkenyl, cycloalkyl and phenyl, X is halogen and n is an integer from 1 to 2, with (2) a compound selected from the group consisting of a monohydric alcohol, an alkylene oxide and a combination thereof and (3) an epoxide selected from the group consisting of an epoxide of the formula



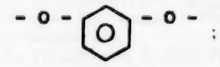
wherein R_2 is selected from the group consisting of phenyl and the amino, halogen and alkyl substituted derivatives thereof, alkyl, alkenyl, acrylo and methacrylo; styrene oxide; an epoxide of the formula



wherein R_3 is a divalent organic group selected from the group consisting of alkylene, alkyleneoxyalkylene, oxyalkyleneoxy, oxyalkyleneoxyalkyleneoxy, a group having the formula



and a group having the formula



and a cyclohexane epoxide, with the ratio of the number of epoxide equivalents of (3) to the number of moles of (1) being less than 2 when the epoxide (3) contains two or more epoxy groups per mole.

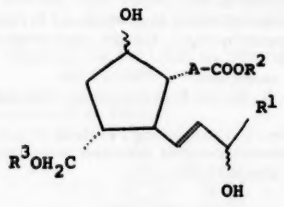
3,899,525

9ξ,15ξ-DIHYDROXY-11α-HYDROXYMETHYLPROST-13(TRANS)-ENOIC ACID DERIVATIVES

Osamu Oda; Kiyoshi Sakai; Takashi Yusa, and Hamako Katano, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Aug. 27, 1973, Ser. No. 392,113
Claims priority, application Japan, Sept. 1, 1972, 47-88171
Int. Cl. C07c 61/32, 67/00, 69/74
U.S. Cl. 260—463 **6 Claims**

1. Compounds having the formula



wherein A represents an alkylene group having from 4 to 8 carbon atoms, R^1 represents an alkyl group having from 1 to 10 carbon atoms, R^2 represents hydrogen atom or an alkyl group having from 1 to 6 carbon atoms and R^3 represents hydrogen atom or an alkoxycarbonyl group having from 1 to 6 carbon atoms in the alkyl moiety and pharmaceutically acceptable salts thereof.

3,899,526

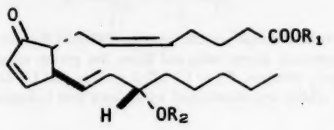
EXTRACT CONTAINING PROSTAGLANDINS

William P. Schneider, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 159,526, July 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 71,431, Sept. 11, 1970, abandoned. This application Oct. 25, 1973, Ser. No. 409,461
Int. Cl.² C07C 61/38, 69/74, 51/48, 67/48
U.S. Cl. 260—468 D **12 Claims**

1. A composition comprising those substances obtained by extracting colonies or colony pieces of the marine invertebrate *Plexaura homomalla* (Esper), 1792, forma S, with a

neutral organic liquid effective to extract a compound represented by the formula:



wherein R_1 and R_2 are both hydrogen, or wherein R_1 is methyl and R_2 is hydrogen or acetyl.

3,899,527

INTERMEDIATES FOR THE PREPARATION OF 1,3-DIHYDRO-2H-1,4-BENZODIAZEPIN-2-ONES

Ronald J. McCaully, Malvern, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 802,345, Feb. 6, 1969, Pat. No. 3,763,171. This application Feb. 15, 1973, Ser. No. 332,861

Int. Cl. C07c *69/16, 69/28*

U.S. Cl. 260—488 GM 2 Claims

1. 2,2-diloweralkanoyloxy acetyl halide.

3,899,528

SUBSTITUTED ETHANE DIPHOSPHONIC ACIDS AND SALTS AND ESTERS THEREOF

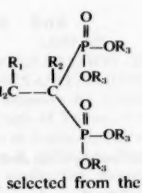
Al F. Kerst, Littleton, Colo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 283,147, Aug. 23, 1972, Pat. No. 3,833,690, which is a division of Ser. No. 27,988, April 13, 1970, Pat. No. 3,705,191. This application Apr. 23, 1974, Ser. No. 463,224

Int. Cl.[2] C07C *69/16*

U.S. Cl. 260—488 J 3 Claims

1. An ethane diphosphonate of the formula



wherein each R_3 is selected from the group consisting of hydrogen, alkali metal ions, and ammonium ions, and R_1 and R_2 are either hydroxy or acetoxy provided that either R_1 or R_2 but not both is always hydroxy.

3,899,529

AROYL SUBSTITUTED NAPHTHALENE ACETIC ACIDS

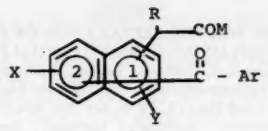
Bruce E. Witzel, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 22, 1973, Ser. No. 334,557

Int. Cl.[2] C07C *65/20, 69/95, 103/22*

U.S. Cl. 260—517 12 Claims

1. A compound of the formula:



wherein

R is hydrogen or C_{1-5} alkyl;

X and Y are each hydrogen, halogen, C_{1-5} alkyl, amino, C_{1-5} alkylamino, C_{1-5} dialkylamino, nitro or trifluoromethyl;

Ar is phenyl, X-substituted phenyl; and

M is hydroxy, C_{1-5} alkoxy, NR'R'' wherein R' and R'' are each hydrogen, C_{1-5} alkyl or hydroxy C_{1-5} alkyl, and the pharmaceutically acceptable salts of the acid; and when

is attached to ring number two, X is hydrogen.

3,899,530

CONTINUOUS CRYSTALLIZATION

Masaaki Syoji; Goro Ishihara; Masao Hirose, all of Mishima; Hidenobu Kubota, and Naoyuki Mitani, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 11, 1972, Ser. No. 314,124

Claims priority, application Japan, Dec. 28, 1971, 46-105709

Int. Cl. C07c *51/42, 63/24, 63/26*

U.S. Cl. 260—525 4 Claims

1. In a continuous method where a supersaturated solution of a crystallizable aromatic carboxylic acid selected from the group consisting of terephthalic acid and isophthalic acid in a solvent selected from the group consisting of water, lower aliphatic carboxylic acid selected from the group consisting of acetic acid and propionic acid, and mixtures thereof, and at a temperature higher than the boiling point of the solvent, is charged into an elongated crystallizer and in the course of such flow is cooled to a temperature lower than the saturation temperature, and then the resulting crystals are taken continuously out of the crystallizer, the improvement comprising the steps of:

a. maintaining a pressure in the crystallizer which is higher than the vapor pressure of the incoming hot solution;

b. maintaining the solution inside the crystallizer as a continuous phase;

c. applying a cooling means effective upon a portion only of said crystallizer, thereby establishing a crystallizing zone and a cooling zone successively adjacent to one another therein, and passing the solution successively through these zones;

d. maintaining the temperature of the cooling zone lower than the saturation temperature of the solution;

e. mixing the contents within said crystallizing zone; and

f. limiting the extent and rate of said mixing to a Pe number within the range of about 0.1 to about 20 so that the solution therein has a temperature gradient such that the temperature of the solution decreases as it nears the cooling zone.

3,899,531
PROCESS FOR THE PREPARATION OF FLUORINE CONTAINING CARBONYL DIHALIDES

Günter Siegemund, Hofheim, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 12, 1973, Ser. No. 424,118
Claims priority, application Germany, Dec. 14, 1972, 2261108
Int. Cl.[2] C07C *51/58*; C01B *17/45*
U.S. Cl. 260—544 F 3 Claims

1. A process for the preparation of carbonyl dihalides of the formula

COFX (I)

wherein X is fluorine, chlorine or bromine, which comprises reacting a perhalomethane of the formula

CFXYZ (II)

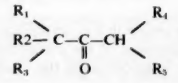
where X is fluorine, chlorine or bromine, Y and Z each are chlorine and/or bromine with the restriction that if X is fluorine Y and/or Z are bromine, and if X is bromine Y and Z are also bromine, with sulfur trioxide in the presence of sulfuric acid or a catalyst consisting essentially of mono- or bivalent mercury salts or mixtures thereof, at a temperature of from −10° to +100°C.

3,899,532
METHOD FOR THE SIMULTANEOUS PRODUCTION OF ORGANIC ACID CHLORIDES AND CHLORINATED UNSATURATED HYDROCARBONS

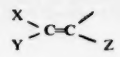
Jean-Claude Lanet, Saint-Auban, France, assignor to Rhone-Progil, Courbevoie, France

Filed Oct. 29, 1973, Ser. No. 410,966
Claims priority, application France, Oct. 31, 1972, 72.38554
Int. Cl.[2] C07C *21/04*
U.S. Cl. 260—544 M 17 Claims

1. A method for the simultaneous production of organic acid chloride and chlorinated unsaturated hydrocarbons, characterized in that a ketone having the general formula:



is reacted, by heating, in the presence of a Lewis acid as a catalyst, with a trichloromethylated hydrocarbon having a double bond in the alpha position and having the formula R — CCl_3 in which R_1, R_2, R_3, R_4 and R_5 represent atoms selected from the group consisting of hydrogen, halogens, C_1 to C_3 alkyl groups unsubstituted or substituted by halogens or C_6 to C_{10} aryl groups which may be unsubstituted or substituted by C_1 to C_3 alkyl groups or halogens; and R represents a group selected from the group consisting of (a) a C_6 or C_{10} aromatic hydrocarbon residue, unsubstituted or substituted by at least one group selected from the group consisting of C_1 to C_3 alkyl groups, and at least one halogen atom and (b) an alkenyl group having the formula



in which X, Y and Z are the same or different from each other and represent atoms selected from the group consisting of hydrogen, halogen, C_1 to C_3 alkyl groups and C_1 to C_3 alkyl groups which are substituted by at least one halogen atom.

3,899,533
CHLORINATED MANDELAMIDINES

Maddy Souchard, Champigny-Sur-Marne, France, assignor to Societe Anonyme dite: Orsymonde, Paris, France

Filed Nov. 21, 1973, Ser. No. 417,772
Claims priority, application France, Nov. 24, 1972, 72.41908
Int. Cl.[2] C07C *123/00*
U.S. Cl. 260—564 G 1 Claim

1. 2,6-Dichloromandelamidoxime.

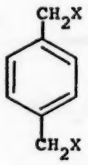
3,899,534
CROSS-LINKED POLYELECTROLYTES

Alan Rembaum, and Shiao-Ping S. Yen, both of Altadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 188,619, Oct. 12, 1971, abandoned. This application Apr. 30, 1973, Ser. No. 355,927
Int. Cl. C07c *87/68*
U.S. Cl. 260—567.6 P 6 Claims

1. A cross-linked, water-insoluble, polyquaternary ammonium polymer consisting essentially of the quaternized reaction product of:

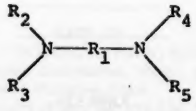
a dihalo substituted organic compound selected from the group consisting of compounds of the formulae:



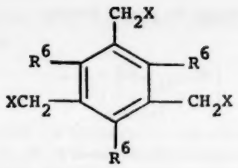
and $X—(CH_2)_yX$

where X is chloro, bromo or iodo and y is an integer from 2–20;

a ditertiary amine of the formula:



where R_1 is alkylene containing from 3–20 carbon atoms; R_2–R_5 are individually alkyl containing 1–20 carbon atoms; and at least 0.1 and no more than 31 weight percent of a cross-linking agent of the formula:



where X is chloro, bromo or iodo and R^6 is hydrogen, methyl or $-CH_2X$, said reactants being present in an essentially stoichiometric ratio of nitrogen to halogen.

3,899,535

CORROSION INHIBITOR COMPOSITION AND PROCESS

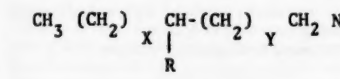
Louise H. Brown, Santa Monica, and Ronald Swidler, Pasadena, both of Calif., assignors to Tallow Company, Salinas, Calif.

Continuation-in-part of Ser. Nos. 111,495, May 22, 1961, abandoned, and Ser. No. 504,217, Oct. 23, 1965, abandoned. This application Oct. 3, 1973, Ser. No. 403,337

Int. Cl. C07c *87/28*

U.S. Cl. 260—570.8 R 5 Claims

1. Amines having the formula:



wherein Y is greater than 3 and X + Y is 15 and R is an aryl radical.

3,899,536

PREPARATION OF 2,4,6,2′,4′,6′-HEXANITRO-DIPHENYLAMINE

Hubert Girardon, Villeneuve les Avignon, and Jean Marie Emeury, Sorgues, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed May 8, 1972, Ser. No. 251,475

Claims priority, application France, May 18, 1971, 71.17872

Int. Cl. C07c *87/60*

U.S. Cl. 260—576 8 Claims

1. A process for the preparation of Hexyl of melting point 252°C which consists of a first nitration stage in which 2,4,6-trinitro-diphenylamine is nitrated to pentanitrodiphenylamine with aqueous nitric acid having a concentration of from 45 to 65% of nitric acid by weight using a nitric acid: trinitrodiphenylamine weight ratio of from 4 to 10 at a temperature of from 75°–80°C, nitration being terminated after 1 to 3 hours, and a second nitration stage in which the pentanitrodiphenylamine obtained is nitrated to 2,4,6,2′,4′,6′-hexanitrodiphenylamine with nitric acid having a concentration of from 90 to 100% by weight of nitric acid using a nitric acid: pentanitro-diphenylamine weight ratio of from 4 to 10 at a temperature of from 50° to 70°C, nitration being terminated after ½ to 3 hours.

3,899,537

PRODUCING BENZOPHENONE AND RELATED PRODUCTS

Hans D. Holtz, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 12, 1972, Ser. No. 271,031

Int. Cl. C07c *49/76, 45/04*

U.S. Cl. 260—591 11 Claims

1. The oxidation of a stilbene under conditions to produce a benzophenone which comprises subjecting said stilbene dissolved in a solvent selected from carboxylic acids and halogenated aromatic compounds in the presence of a catalyst having the formula $C_nX_{2n+1}CO_2H$ wherein X is fluorine or chlorine and *n* can be 1–10, to the action of oxygen under pressure.

11. The oxidation of diphenylacetaldehyde under a pressure of oxygen to produce benzophenone in the presence of trifluoroacetic acid and, as a solvent, chlorobenzene.

3,899,538

ACID-CATALYZED DECOMPOSITION OF ALIPHATIC HYDROPEROXIDES

John O. Turner, Shavertown, and Norman C. Deno, State College, both of Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 98,035, Dec. 14, 1970, abandoned, which is a continuation-in-part of Ser. No. 54,578, July 13, 1970, abandoned. This application Jan. 8, 1974, Ser. No. 431,634

Int. Cl. C07c *49/04*

U.S. Cl. 260—593 R 5 Claims

1. A process for the preparation of ketones and alcohols which comprises contacting a tertiary alkyl hydroperoxide or peroxide having from about 3 to 12 carbon atoms at a temperature of from about 0° to 20°C with an acid having a concentration of at least about 80 percent based on the weight of the total reaction mixture, wherein said acid is selected from the group consisting of hydrochloric, sulfuric, oleum, fluorosulfonic and perchloric acid.

3,899,539

PROCESS FOR THE PREPARATION OF PROPIONALDEHYDE

Hans Fernholz, Fischbach, Taunus; Friedrich Wunder, Florsheim, Main, and Hans-Joachim Schmidt, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 27, 1971, Ser. No. 137,944

Claims priority, application Germany, Apr. 29, 1970, 2020890

Int. Cl.² C07C *41/02*

U.S. Cl. 260—601 R 10 Claims

1. A process for the preparation of propionaldehyde, which comprises the step of reacting a saturated carboxylic acid allyl ester wherein said saturated carboxylic acid is free of further functional groups and having up to 12 carbon atoms in the molecule, in the presence of from1 to 10 moles of water per mole of carboxylic acid allyl ester at a temperature of between 75°C and 300° from in the gaseous phase and in the presence of an acid catalyst selected from the group consisting of orthophosphoric acid, pyrophosphoric acid, polyphosphoric acids, silico-tungstic acid, phosphomolybdic acid, boro-tungstic acid, and phospho-tungstic acid, phosphotungstic-molybdic acid and mixtures thereof.

3,899,540

HYDROXYLATION PROCESS

Takashi Suzuki, and Susumu Naito, both of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Ltd., Tokyo, Japan

Filed Jan. 28, 1974, Ser. No. 437,242
Claims priority, application Japan, Jan. 31, 1973, 48-11889
Int. Cl. C07c *37/00*
U.S. Cl. 260—621 G 5 Claims

1. A process for preparing a hydroxylated aromatic compound which comprises reacting at least one aromatic compound selected from the group consisting of unsubstituted aromatic hydrocarbons and aromatic hydrocarbons substituted with lower alkyl, lower alkoxy, halogen and hydroxy with hydrogen peroxide in the presence of trifluoroacetic acid and hydrogen fluoride at a temperature of from −70°C. to +50°C.; at least one mole of trifluoroacetic acid and 5 to 50 moles of hydrogen fluoride being employed per mole of hydrogen peroxide.

3,899,541

PROCESS FOR COUPLING IODOPERHALO COMPOUNDS

Henry R. Nychka, East Aurora, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 818,107, April 21, 1969, Pat. No. 3,637,868. This application Dec. 27, 1971, Ser. No. 212,821
Int. Cl.[2] C07C *17/26*
U.S. Cl. 260—648 F 16 Claims

1. The method which comprises coupling two iodoperhalo organic reactants of the formula

and

wherein R_a, R_b, R_a' and R_b' are independently fluorine or a perhalo radical of 1 to 24 carbon atoms selected from the group consisting of perhaloalkyl, perhalocycloalkyl and perhaloalkylene substituted perfluoroaryl, with the provisos that the total number of carbon atoms in each iodoperhalo organic reactant being no more than 37, both R_a and R_b are not fluorine, both R_a' and R_b' are not fluorine, and iodine atoms are separated from C° and C′ and from each other, if at least two are present, by at least one non-iodo containing carbon atom, by reacting said iodoperhalo organic reactants with a metal fluoride selected from the group consisting of CsF, RbF, KF and BaF_2, at a temperature of at least about 275°C.

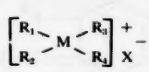
3,899,542

PREPARATION OF ALKYL HALIDES

Charles M. Starks, Ponca City, Okla., and Ronnie D. Gordon, Richardson, Tex., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 10,045, Feb. 9, 1970, abandoned. This application Mar. 10, 1972, Ser. No. 233,769
Int. Cl. C07c *17/20*
U.S. Cl. 260—658 R 5 Claims

1. In a halogen exchange process wherein a halogen of a first liqiud halogen substituted alkane is exchanged with a different halogen of a second liquid halogen substituted alkane, said halogen being chlorine, bromine or iodine, the improvement comprising utilizing as the catalyst an organic quaternary salt having the general formula



wherein M is nitrogen or phosphorous; R_1, R_2, R_3, and R_4 are alkyl groups containing from 1 to about 30 carbon atoms respectively; and X is halide, sulfate, hydrocarbon sulfonate, or acetate.

3,899,543

PROCESS FOR HYDROGENATING AROMATIC COMPOUNDS CONTAINING SULFUR IMPURITIES

Jean Cosyns, Nanterre; Jean-Pierre Franck, Bougival, and Jean-Francois Le Page, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed Aug. 31, 1973, Ser. No. 393,607
Claims priority, application France, Sept. 1, 1972, 72.31209
Int. Cl. C07c *5/10*
U.S. Cl. 260—667 14 Claims

1. A process for hydrogenating a feedstock of aromatic compounds containing sulfur impurities in which a mixture of hydrogen with at least one aromatic compound containing sulfur impurity is contacted, at a temperature of from 200° to 450°C, under a pressure of from 10 to 200 kg/cm², in successive order with:

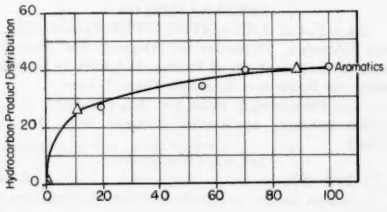
A. A catalyst containing:
   a. at least one desulfurizing element selected from the oxides and/or sulfides of molybdenum, tungsten, nickel and cobalt;
   b. alumina and,
   c. iron oxide, the ratio by weight of Al_2O_3 to Fe_2O_3 in this catalyst being from 0.25 to 4; and,
B. A group VIII metal hydrogenation catalyst.

3,899,544

CONVERSION OF ALCOHOLS AND ETHERS TO HYDROCARBONS

Clarence D. Chang, Princeton, and William H. Lang, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 28, 1974, Ser. No. 455,692
Int. Cl. C07c *1/20*
U.S. Cl. 260—668 C 8 Claims



1. In the process of converting lower aliphatic organic feed compounds containing up to about 8 carbon atoms in a hydrocarbyl constituent thereof and at least one hetero atom selected from the group consisting of sulfur, oxygen, nitrogen and halogen to a higher hydrocarbon product having a substantial fraction in the C_5 to 400°F boiling range by contacting said feed with a crystalline aluminosilicate zeolite, havig a silica to alumina ratio of at least about 12 and a constraint index of about 1 to 12, at about 500° to 8850°F, up to about 50 atmospheres, 0.5 to 50 LHSV and in the substantial absence of added, preformed hydrogen; the improvement which comprises utilizing as said catalyst said zeolite containing

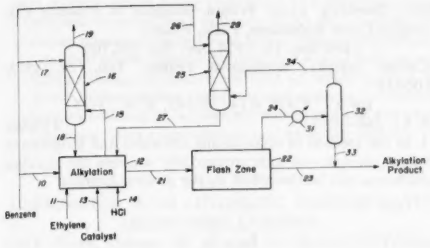
about 30 to 85% of its cation cites satisfied by a Lewis or Bronsted base.

3,899,545

RECOVERY OF HYDROGEN CHLORIDE IN AN ALKYLATION PROCESS

Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Dec. 12, 1973, Ser. No. 423,902
Int. Cl. C07c *3/54*
U.S. Cl. 260—671 R **6 Claims**



1. In a process for alkylating an aromatic hydrocarbon by contact with an olefinic gas in an alkylation zone in the presence of a metal chloride alkylation catalyst wherein a gaseous effluent, containing hydrogen chlordie, and a liquid effluent containing alkylated aromatic hydrocarbon, unreacted aromatic hydrocarbon and dissolved hydrogen chloride are withdrawn from the alkylation reaction zone, the improvement comprising:

a. flashing the liquid effluent to reduce the hydrogen chloride content thereof and produce a flash gas, containing hydrogen chloride, alkylated aromatic hydrocarbon and unreacted aromatic hydrocarbon;

b. cooling the flash gas to condense alkylated aromatic hydrocarbon and a major portion of the aromatic hydrocarbon and produce a remaining flash gas;

c. directly contacting the remaining flash gas and the gaseous effluent from the alkylation zone with aromatic hydrocarbon to be used as fresh feed to the alkylation zone to absorb hydrogen chloride; and

d. introducing into the alkylation zone aromatic hydrocarbon containing hydrogen chloride absorbed from the gaseous effluent and the remaining flash gas.

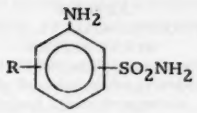
3,899,546

INTUMESCENT COMPOSITIONS CONTAINING AN AMINO BENZENESULFONAMIDE RESIN AND AN EPOXY RESIN

William S. Stoy, Princeton, and Shirley H. Roth, Highland Park, both of N.J., assignors to Cities Service Company, Tulsa, Okla.

Filed Nov. 1, 1972, Ser. No. 302,990
Int. Cl. C08g *45/10*
U.S. Cl. 260—834 **8 Claims**

1. A composition comprising (A) about 1–9 parts by weight of an interpolymer of at least one amine with formaldehyde, at least half of the combined amine units of the interpolymer being residues of an amine corresponding to the formula:



wherein R is hydrogen, alkyl, haloalkyl, alkoxy, haloalkoxy, halo, nitro, acetamido, or sulfonamido, (B) respectively, about 9-1 parts by weight of an epoxy resin which is a polyglycidyl ether of an aliphatic or aromatic polyol, and (C) a substantially stoichiometric amount of a curing agent.

3,899,547

PROCESS FOR PREPARING VINYL CHLORIDE COMPOSITIONS CONTAINING BUTADIENE AND BUTADIENE-STYRENE COPOLYMERS

Yasuo Amagi, Tokyo, and Haruhiko Yusa, Iwaki, both of Japan, assignors to Kureha Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 135,398, April 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 753,602, Aug. 19, 1968, abandoned. This application Jan. 4, 1974, Ser. No. 430,937
Claims priority, application Japan, Aug. 19, 1967, 42-53212
Int. Cl. C08f *15/00, 19/00*
U.S. Cl. 260—876 R **1 Claim**

1. A process for producing a vinyl composition of high transparency, heat-stability, and impact strength, which comprises:

a. adding to 100 parts by weight of a solid content of a latex containing from 40 to 70 parts by weight of a substance selected from the group consisting of butadiene polymers and butadiene-styrene copolymers, with butadiene as the principal constituent and a fatty acid surfactant having 10 to 20 carbon atoms as an emulsifier for preparing the latex, 0.05 – 0.5 parts by weight of a dispersion stabilizer selected from the group consisting of dioctyl ester sulphosuccinate and alkylbenzene sulphonate;

b. adding to said stabilized latex as acidic substance to produce coagulated particles having average particle size of from 0.2 to 0.5 micron;

c. dividing a plastic component to be post-polymerized in a proportion of from 60 to 30 parts by weight with said coagulated particles into

1. from 50 to 90 percent by weight of a first portion which is a monomer mixture of styrene and methyl methacrylate with styrene as its principal constituent and

2. from 50 to 10 percent by weight of a second portion selected from the group consisting of methylmethacrylate monomer and monomer mixture of styrene and methyl methacrylate with methyl methacrylate as the principal constituent;

d. causing post-polymerization of said first portion of the plastic component with said coagulated particles in the presence of from 0.01 to 5 parts by weight of a crosslinking agent;

e. then causing post-polymerization of said second portion on said post-polymerized first portion in the presence of from 0.1 to 5 parts by weight of a cross-linking agent thereby to prepare a resin; and

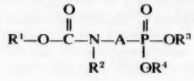
f. blending from 1 to 20 percent by weight of said resin with from 99 to 80 percent by weight of a substance selected from the group consisting of polyvinyl chloride and copolymers containing vinyl chloride as the principal constituent thereof.

3,899,548
N-(DIALKYLPHOSPHONOALKYL)-CARBAMIC ACID ALKYL ESTERS

Harro Petersen, Frankenthal; Friedrich Fuchs, Kirchheim, and Peter Scharwaechter, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 17, 1974, Ser. No. 479,893
Int. Cl. C07f *9/40*
U.S. Cl. 260—932 **16 Claims**

1. A substance of the formula:



in which

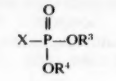
R^1, R^2, R^3 and R^4 are identical or different and are alkyl of one to five carbon atoms,

R^3 and R^4 may also be chlorinated alkyl of one to five carbon atoms or together may be alkylene of two to three carbon atoms,

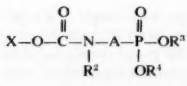
R^2 may also be hydrogen, methylol or alkoxymethyl of one to three carbon atoms in the alkoxy,

A is unbranched or branched alkylene of two to eight carbon atoms of which at least two are situated in the chain connecting nitrogen and phosphorus, and

R^1 may also be a radical of the formula:



or:



in which

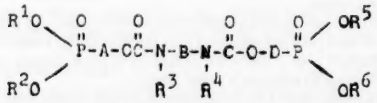
X is linear or branched alkylene of two to eight carbon atoms which may be interrupted by oxygen atoms, and R^2, R^3 and R^4 have the meanings given above.

3,899,549
POLY(DIALKYLPHOSPHONOALKYL)CARBAMATES

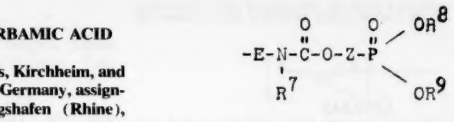
Harro Petersen, Frankenthal; Friedrich Fuchs, Kirchheim, and Peter Scharwaechter, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 6, 1974, Ser. No. 448,549
Claims priority, application Germany, Mar. 10, 1973, 2312090
Int. Cl. C07f *9/40*; **D06c** *27/00*
U.S. Cl. 260—932 **1 Claim**

1. Substances of the formula



in which R^1, R^2, R^5 and R^6 denote C_{1-4} alkyl optionally substituted by halogen atoms, R^3 and R^4 denote hydrogen, C_{1-3} alkyl, methylol or C_{1-3} alkoxymethyl or a radical of the formula:



in which R^7 is hydrogen, C_{1-3} alkyl, a methylol or C_{1-3} alkoxymethyl group and R^8 and R^9 are C_{1-4} alkyl optionally substituted by halogen atoms or together form alkylene of 2 to 3 carbon atoms, and the radicals A, B, D, E and Z are the same or different and denote alkylene radicals of from 2 to 6 carbon atoms.

3,899,550
METHOD FOR ALKOXYLATION OF CHLORIDES AND BROMIDES OF TRIVALENT PHOSPHORUS

Michel Demarcq, Lyon, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jan. 16, 1974, Ser. No. 433,709
Claims priority, application France, Feb. 21, 1973, 73.06041
Int. Cl.² C07F *9/141*, *9/142*, *9/145*, *9/15*
U.S. Cl. 260—977 **9 Claims**

1. In the method of alkoxylating chlorides and bromides of trivalent phosphorus with an epoxide, wherein the trivalent phosphorus can be described by the general formula

where X can be chlorine or bromine, Y and Z can each (independently of each other) be chlorine or bromine or a monovalent radical R-, RO-, RS- or RR'N- wherein R is selected from the group of C_1–C_{30} radicals consisting of alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, alkylaryl and arylalkyl radicals and their derivatives wherein one or more hydrogen atoms are substituted by chlorine, bromine, oxygen, sulfur, nitrogen or phosphorus and wherein R' can be hydrogen or R and wherein R and R' can together form a ring and wherein Y and Z also can together form a ring,

the improvement which comprises performing said alkoxylating, in the presence and absence of a stabilizing base, and in the presence of a suitable catalytic quantity of an organic aluminum compound selected from (1) compounds having the formula

where Q', and Q'' and Q''' can be the same or different from each other and can each be C_1–C_{10} alkyl or aryl, C_1–C_{10} alkoxyl or aryloxyl and can each have one hydrogen substituted by halogen aluminum nitrilotriethylate, (3) aluminum acetylacetonate and (4) aluminum dimedonate.

3,899,551
APPARATUS FOR CONTROLLING AND MODULATING ENGINE FUNCTIONS

Alfred C. Korte, St. Louis, Mo., assignor to ACF Industries, Incorporated, St. Louis, Mo.

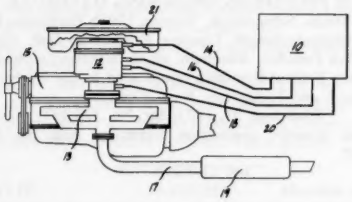
Filed Feb. 9, 1973, Ser. No. 331,220
Int. Cl. F02m *1/10*, *7/00*
U.S. Cl. 261—39 A **5 Claims**

1. In an internal combustion engine having a plurality of engine functions operable by the suction created by the natural aspiration of said engine during running condition, the improvement comprising;

an attachment connected to said engine communicating on one side with ambient air and on another side with at least

one suction-controlled passage leading to at least one engine function controlling means,

said attachment including control means responsive to barometric and/or temperature changes to change a dimension of said control means,



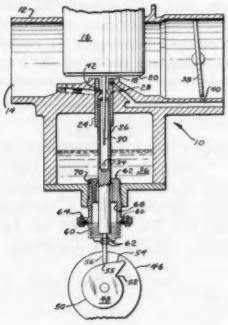
said control means being connected to a metering means adapted to admit said ambient air to said suction-controlled passage in accordance with changes in said dimension, said control means comprising a sealed bellows, said bellows being adapted to increase its length upon a decrease in the absolute density of said ambient air, and said bellows abutting an adjustment means in a pivoted plate, said plate being connected to said metering means.

3,899,552

CARBURETOR WITH AUTOMATIC AIR-FUEL RATIO ADJUSTMENT CONTROL

Carl F. Bauer, Chicago, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 1, 1974, Ser. No. 447,439
Int. Cl.[2] F02M *9/06*
U.S. Cl. 261—44 R **5 Claims**



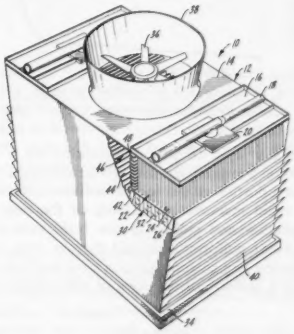
1. Apparatus for continuously adjusting the air-fuel ratio of a carburetor of the type having a fuel bowl, a tubular main fuel jet valve seat mounted in the fuel bowl and a tapered main fuel jet needle valve mounted to move within said tubular main jet valve seat and axially relative thereto to vary the flow of fuel from said jet, said apparatus comprising means for mounting said tubular main fuel jet valve seat for rapid reciprocatory movement along its axis, said mounting means including resilient means comprising a corrugated bellows member for biasing said tubular main jet valve seat in one direction relative to the tapered main jet needle, said mounting means further including a contact portion positioned externally of said fuel bowl and adapted when contacted to move said tubular main jet valve seat in an opposite direction and against the bias of said resilient means, and means periodically operative in response to an electrical signal indicative of a desired change in the air-fuel ratio of the carburetor to contact said contact portion and either drive said tubular main jet a predetermined distance in said opposite direction or permit said resilient means to move said tubular main jet a predetermined distance in said one direction.

3,899,553

COOLING TOWER PLUME CONTROL

Donn B. Furlong, San Rafael, and John C. Ovard, Santa Rosa, both of Calif., assignors to Ecodyne Corporation, Lincolnshire, Ill.

Filed July 27, 1973, Ser. No. 383,219
Int. Cl. F28c *1/00*
U.S. Cl. 261—109 **12 Claims**



1. A wet/dry cooling tower for controlling plume emission to the atmosphere, comprising: a wet section and a dry section; said dry section being positioned immediately above said wet section; separate air inlet means associated with said wet section and dry section for respectively directing ambient air therethrough in a substantially horizontal direction; a hot water distribution basin positioned immediately above said dry section so as to define the upper portion of said dry section and a substantially horizontal partition deck separating said wet section from said dry section; a plurality of substantially vertical heat exchange tubes positioned within said dry section having upper ends which extend through openings in the floor of said basin for receipt of hot water therefrom and lower ends which extend through openings in said partition deck into said wet section; said lower ends of said heat exchange tubes having spray nozzle means directly secured thereto for receiving and spraying partially cooled water from said tubes over said wet section; a cold water collection basin positioned below said wet section for collecting cooled water passing through said dry section; movable louver means provided for selective control of ambient air flow through said wet and dry sections dependent upon atmospheric conditions; and a plenum area centrally disposed within said tower for receiving and mixing together the exhaust air passing through said wet and dry sections prior to its return to the atmosphere.

3,899,554

PROCESS FOR FORMING A CERAMIC SUBSTRATE

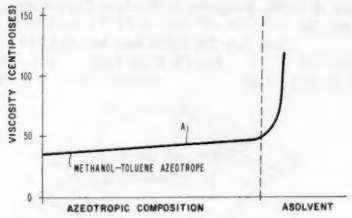
Harold D. Kaiser, Poughkeepsie, and Robert W. Nufer, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1973, Ser. No. 425,040
Int. Cl. B29d *27/04;* **C04b** *33/28, 39/12;* **H01l** *7/00*
U.S. Cl. 264—41 **7 Claims**

1. In a process for forming ceramic substrates, the steps comprising:

A. formulating a ceramic slip composition by blending a ceramic particulate with a solvent soluble thermoplastic binder resin dissolved in a volatile organic solvent mixture forming a complete solvent for said resin and comprising a volatile first solvent fraction and a volatile second non-solvent fraction with said first solvent fraction

constituting a complete solvent for said resin and said second fraction being substantially a non-solvent for said resin, said first and second solvent fractions combining to form an azeotropic mixture, with an excess of said non-solvent fraction;



B. forming a layer of said composition on a removable support, evaporating the azeotropic mixture so as to leave at least a portion of the second solvent fraction for causing a rapid increase in viscosity of the resin and then precipitation and gelling of the resin with the second non-solvent uniformly trapped therein; and evaporating said second non-solvent fraction from said resin structure to form a uniform distribution of micropores therein.

3,899,555

METHOD OF PREPARING CERAMIC STRUCTURES

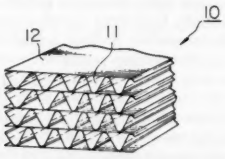
Hiroshi Takao, Yokosuka; Kinmochi Togawa, Tokyo; Satoshi Abe, and Sigeyosi Nakagawa, both of Yokosuka, all of Japan, assignors to Nissan Motor Company Limited, Japan

Filed Dec. 27, 1971, Ser. No. 212,019

Claims priority, application Japan, Jan. 13, 1971, 46-678

Int. Cl. B29h *7/20*

U.S. Cl. 264—44 **5 Claims**



1. A method of preparing a ceramic structure, comprising the steps of:

a. dispersing a mixture comprising particulate ceramic materials in powder or short fiber form together with short cellulose fibers in an aqueous medium to form a non-colloidal slurried suspension of the particulate ceramic materials and the cellulose fibers in said aqueous medium,

b. introducing said suspension onto a wire cloth papermaking machine;

c. draining said aqueous medium from said insoluble particulate material and fibers through said wire cloth to form a matted sheet of particulate material and cellulose fibers on said wire cloth;

d. removing said sheet from said wire cloth to form a paper sheet in which said mixture of ceramic materials and said cellulose fibers are randomly and uniformly dispersed;

e. drying the resultant paper sheet to remove excess water and to form a plasticized green ceramic sheet;

f. forming said green ceramic sheet into a plasticized green honeycomb structure;

g. baking the green honeycomb structure for a time and at a temperature sufficient for sintering the particulate ceramic materials dispersed therein, to a self-supporting honeycomb and for burning off the cellulose fibers dispersed therein, thereby leaving a porous ceramic honeycomb having its pores randomly distributed in the wall thereof.

3,899,556

PROCESS FOR PRODUCING IMPLANTABLE, POROUS, CERAMIC, BONE SUBSTITUTION, BONE CONNECTION OR PROSTHESIS ANCHORING MATERIALS

Helmut Heide, Schwalbach, Taunus; Ulrich Hoffmann, Eschborn-Niederhochstadt; Gunther Brotz, Stierstadt, Taunus, and Eva Poeschel, Altenhain, all of Germany, assignors to German Federal Republic, represented by the Minister for Research and Technology, Bonn, Germany

Filed Aug. 31, 1973, Ser. No. 393,487

Claims priority, application Germany, Aug. 31, 1972, 2242867

Int. Cl. B29h *7/20*

U.S. Cl. 264—44 **21 Claims**

1. The process for producing an implantable, porous, cermaic bone substitution- or bone connection - or prosthesis anchoring material, and the like, which has open pores of substantially regular or uniform size, distribution and disposition which comprises: (a) producing a frame which corresponds approximately to the pores and pore interconnections of the desired finished product, the frame being formed by preparing a compact arrangement of spherical bodies, which are approximately of equal or uniform size, filling said compact arrangement of spherical bodies with a liquid which gradually, gently dissolves said bodies, said liquid gradually, gently dissolving part of said filler bodies, the time of dissolving being sufficient to dissolve enough of said filler bodies so that bridges of the dissolved portion of said filler bodies can form bridges after said liquid is removed, and removing said liquid so that a liquid film remains on said bodies, said film constituting a liquid medium meniscus at the points or edges of contact of said bodies, whereby bridges of said dissolved portion said filler bodies form between said filler bodies; (b) filling the frame with a physiologically suitable and biologically compatible castable or pourable ceramic mass; and (c), after at least a partial hardening of the ceramic mass, dismantling or decomposing and removing the frame, whereby said desired finished product or said ceramic material is obtained.

3,899,557

HOLLOW SEMICONDUCTOR BODIES AND METHOD OF PRODUCING THE SAME

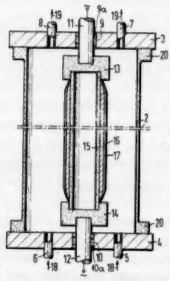
Wolfgang Dietze, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 29, 1973, Ser. No. 410,758

Claims priority, application Germany, Oct. 31, 1972, 2253411

Int. Cl. C23c *11/06*

U.S. Cl. 264—81 **14 Claims**



1. A method of producing a directly heatable hollow semiconductor body formed of at least two distinct layers and being useful in diffusion processes comprising:

vapor depositing a continuous layer of a first semiconductor material selected from the group consisting of silicon and doped silicon onto a graphite carrier surface until a desired thickness thereof is attained;

vapor depositing a continuous layer of a second semiconductor material selected from said group onto said layer of said first semiconductor material until a desired thickness thereof is attained and a hollow semiconductor body is formed on said carrier surface; and

removing said carrier surface without destroying said layers of semiconductor materials;

whereby said hollow semiconductor body has an inner surface composed of one of said semiconductor materials of said group and has an outer surface composed of the other semiconductor material of said group.

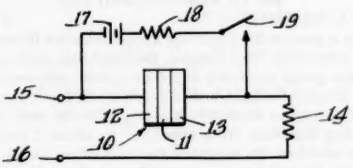
3,899,558
METHOD OF MAKING A CURRENT CONTROLLING DEVICE INCLUDING VO_2

Gordon R. Fleming, Pontiac, and Stanford R. Ovshinsky, Bloomfield Hills, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Division of Ser. No. 830,581, May 27, 1969, Pat. No. 3,588,638, which is a continuation-in-part of Ser. No. 809,580, March 24, 1969, abandoned. This application Sept. 8, 1970, Ser. No. 70,155

Int. Cl. C04b *35/00;* **B29g** *7/00*

U.S. Cl. 264—104 **11 Claims**



1. The method of making a semiconductor element of a current controlling device for an electrical circuit including a semiconductor element and electrodes in low electrical resistance contact therewith, wherein said semiconductor element has a threshold voltage value and a high electrical resistance to provide a blocking condition for substantially blocking current therethrough, and wherein said high electrical resistance in response to a voltage above said threshold voltage value substantially instantaneously decreases between the electrodes to a low electrical resistance which is orders of magnitude lower than the high electrical resistance to provide a conducting condition for substantially conducting current therethrough, said method comprising, substantially individually coating high electrical resistance refractory powder particles with a thin solid coating of substantially VO_2 within a moler percent range of about 5 to 25% of substantially VO_2, and forming said semiconductor element from said substantially VO_2 coated refractory powder particles.

3,899,559
METHOD OF MANUFACTURING WAFERBOARD

Fred E. Johnanson, Vancouver, and William L. Watkins, Hudson Bay, both of Canada, assignors to MacMillan Bloedel Research Limited, Vancouver, Canada

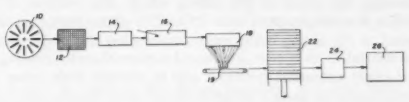
Filed Dec. 27, 1972, Ser. No. 318,840

Claims priority, application Canada, Nov. 24, 1972, 157386

Int. Cl. B29j *5/02*

U.S. Cl. 264—115 **10 Claims**

1. A method of manufacturing waferboard, which comprises cutting thin wafers from wood logs having a moisture content of about 40 to about 70% based on dry weight of the wood, screening the cut wafers to remove therefrom any fine wood particles, drying the wafers at surface temperatures ranging from about 200° to about 240°F to reduce the moisture content thereof to about 2 to about 10% based on the dry weight of the wood, mixing the wafers with about 1.5% to about 4% by weight fine powdered binder resin and from 1 to 6% by weight wax in molten or emulsified form to coat each wafer with a coat of wax covered by powdered resin, depositing the coated wafers uniformly on supporting plates to form



thereon mats of wafers of uniform density and thickness, pressing the mats of wafers on the plates in a hot press at temperatures ranging from about 390° to about 430°F for a suitable time to form waferboards of predetermined thickness and density, and cooling said boards and storing the boards in hot stacks at temperatures from about 210° to about 300°F to prevent thermal degradation.

3,899,560
METHOD OF PREPARING TRANSPARENT ALUMINA

David J. Sellers, Peperell; William H. Rhodes, Lexington, and Thomas Vasilos, Winthrop, all of Mass., assignors to Avco Corporation, Cincinnati, Ohio

Division of Ser. No. 717,585, April 1, 1968. This application Feb. 14, 1972, Ser. No. 226,338

Int. Cl. C04b *35/10;* **B29c** *25/00*

U.S. Cl. 264—65 **7 Claims**

1. A process for producing transparent polycrystalline alumina having a primary recrystallized grain structure with C axis orientation of grains parallel to the direction of plastic deformation of the alumina crystals comprising:

forming a compact consisting essentially of submicron particles of high purity polycrystalline alumina having a purity in excess of 99.90%;

stabilizing the compact at a temperature in the region of 1800°C to 1900°C without substantial grain growth;

hot forging said compact by compressing without lateral constraints at a pressure of at least 3000 p.s.i. to introduce into said compact material a strain in excess of the critical strain; and

annealing said compact under pressure for 70 minutes to 6 hours to induce primary recrystallization.

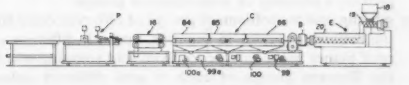
3,899,561
METHOD OF MAKING PLASTIC SIDING

Peter F. Heilmayr, McPherson, Kans., assignor to Certain-teed Products Corporation, Valley Forge, Pa.

Division of Ser. No. 243,205, April 12, 1972, Pat. No. 3,776,672, which is a continuation-in-part of Ser. Nos. 225,348, Feb. 10, 1972, abandoned, and Ser. No. 225,347, Feb. 10, 1972, abandoned, which is a division of Ser. No. 2,900, Jan. 14, 1970, abandoned, said Ser. No. 225,348, is a continuation of Ser. No. 2,900,. This application July 17, 1973, Ser. No. 380,017

Int. Cl. B29c *17/00, 17/14*

U.S. Cl. 264—151 **1 Claim**



1. In the method of manufacturing siding boards having hanger and butt edges with an intervening panel by plasticating a thermoplastic resin material in a heated extruder, shaping the plasticated resin material by extruding it through a die orifice generally conforming with a desired cross sectional

shape of the siding, cooling and rigidifying the extruded siding, and cutting the extrudate into siding board lengths, the improvement which comprises feeding rigid polyvinyl chloride resin material in powder form to the extruder, extruding the resin generally horizontally through a die orifice having a maximum dimension from 3 to 20% larger than the final width of the siding being made and having a flat mid portion for forming the panel of the siding which mid portion of the orifice is of thickness of from 25 to 75% of the thickness of the panel of the siding being made, embossing the upper side of the extrudate to impart a textured surface thereto, passing the embossed extrudate between and in contact with lower and upper series of spaced templets respectively having concavely curved edges and convexly curved edges for curving the extrudate to a shape having a concave upper side and a convex lower side and bringing the extrudate uniformly to the desired size, directing cooling air against both surfaces of the extrudate as the extrudate passes between the spaced templets to cool and rigidify the extrudate, the lower convex side of the extrudate bearing cooled faster than the upper concave side of the extrudate to minimize warping.

3,899,562

PROCESS FOR THE PRODUCTION OF MIXED YARNS

Anton Seidl, Bad Vilbel, Germany, assignor to Vickers-Zimmer Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 130,085, April 1, 1971, abandoned. This application Oct. 23, 1973, Ser. No. 408,839

Claims priority, application Germany, Apr. 15, 1970, 2018019

Int. Cl.[2] D01D *5/12*

U.S. Cl. 264—210 F **7 Claims**

1. A process for continuously producing a homogeneous, mixed multicolored yarn which comprises the separate steps of:

a. melt spinning a colored, synthetic polyamide or polyester polymer through spinning nozzles and solidifying the resultant polymer to provide a plurality of monofilament groups;

b. melt spinning a second, different colored, synthetic polyamide or polyester through a second different set of spinning nozzles and solidifying the resultant polymer to provide a plurality of monofilament groups;

c. guiding said monofilament groups of different color from the different nozzles in separate, spaced, different colored planes upon emergence from said spinning nozzles, the filament groups of each of said different colored planes being spaced apart and alternating with each other, and combining the monofilament groups of each colored plane to provide a plane of alternately spaced apart, different colored, combined monofilament groups;

d. subsequently gathering said plane of different colored, spaced apart, alternating combined monofilament groups to produce a homogeneous multicolored filament bundle; and,

e. stretching said homogeneous filament bundle.

3,899,563

SYNTHETIC FIBERS HAVING IMPROVED SOIL AND STAIN REPELLENCY

Bryce C. Oxenrider, Florham Park, and Cyril Woolf, Morristown, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

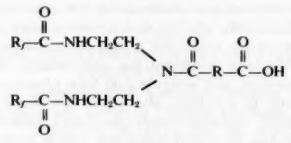
Division of Ser. No. 205,424, Dec. 6, 1971, Pat. No. 3,767,625, which is a division of Ser. No. 867,368, Oct. 17, 1969, Pat. No. 3,646,153. This application July 23, 1973, Ser. No. 381,453

Int. Cl. B28b *3/20;* **D01f** *1/02*

U.S. Cl. 264—211 **4 Claims**

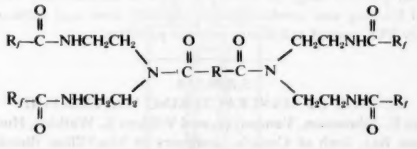
1. In a process for preparing a melt extruded filament of a melt extrudable fiber-forming thermoplastic resin selected from the group consisting of polypropylene, polyamide, polyester, polyacrylonitrile, and blends thereof, the improvement which comprises intimately blending with the resin prior to extruding the resin, from about 0.1 to about 2 percent by weight based on the weight of the resin of an additive which improves the soild and stain repellency of the filament, said additive being selected from the group consisting of:

a. monoamides of the formula

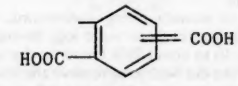


wherein R is an alkyl diradical of 1 to 8 carbon atoms, an alkylene diradical of 2 to 8 carbon atoms, or a phenyl diradical;

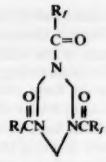
b. diamides of the formula



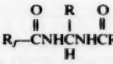
wherein R is an alkyl diradical of 1 to 8 carbon atoms, an alkylene diradical of 2 to 8 carbon atoms, a phenyl diradical, or a dicarboxy phenyl diradical having the formula



c. hexahydrotriazines of the formula

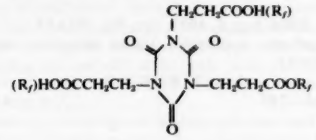


d. bisamides of the formula

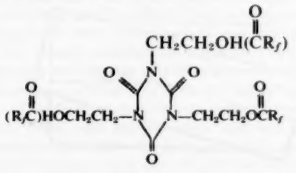


wherein R is hydrogen, trichloromethyl or a phenyl radical;

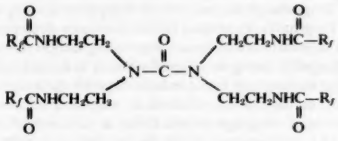
e. isocyanurate esters of the formula



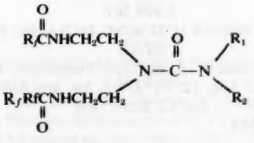
f. isocyanurate esters of the formula



g. substituted ureas of the formula

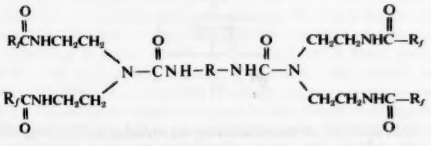


h. substituted ureas of the formula



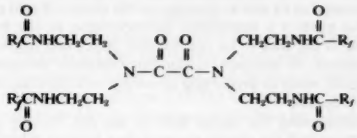
wherein R_1 and R_2 are independently hydrogen or an alkyl radical of 1 to 6 carbon atoms, and alkylene radical of 2 to 6 carbon atoms, or a phenyl radical;

i. substituted ureas of the formula



wherein R is an alkyl diradical of 1 to 13 carbon atoms, an alkylene diradical of 2 to 13 carbon atoms, or an aryl, aralkyl or aralkylene diradical of 6 to 13 carbon atoms; and

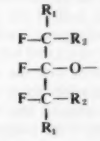
j. substituted oxamides of the formula



R_f being, in each of the above formulas, selected from the group consisting of fluoroalkyl groups having the formula

$$Y(CF_2)_m(CH_2)_n-$$

wherein m is an integer from 1 to 16, n is an integer not greater than m from 0 to 8, with the sum of m plus n being from 1 to 20, and Y is selected from the group consisting of F_3C- and radicals having the formula



wherein R_1 and R_2 are fluorine or perfluoroalkyl groups having from 1 to 2 carbon atoms, provided that not more than three of the R_1 and R_2 groups are perfluoroalkyl groups said additive having a surface energy of less than 20 ergs/cm^2 and being thermally stable and nonfugative at the temperature at which the filament is extruded.

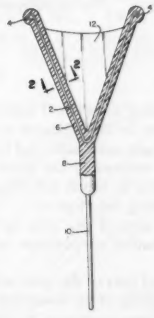
3. The improvement of claim 1 including the additional step of annealing the extruded filament to lower the surface energy of the filament.

3,899,564

METHOD OF MAKING PLASTIC-COATED WIRE OBJECTS SUCH AS INTRAURETERINE CONTRACEPTIVE DEVICES

Milton Kessler, 6690 Harrington Ave., Youngstown, Ohio 44512, and Ronald N. Kessler, 4551 Woodhurst, Apt. 3, Youngstown, Ohio 44515

Filed Nov. 15, 1973, Ser. No. 416,221
Int. Cl. B29c *3/00*; B29f *1/10*
U.S. Cl. 264—255 **3 Claims**



1. Method of making an IUD comprising a V-shaped portion having a springy, soft-plastic-coated metal wire core and a soft-plastic tail portion extending away from the apex of the V comprising

a. molding at least the bottom half of the plastic tail and a bottom plastic part of the V-shaped portion in a two-part

die having a cavity in the bottom half of the die corresponding to the entire bottom half of the plastic coat, the upper half of the two-piece die having a male projection rounded at its end to produce in the center of said plastic coat portion a depression corresponding to the bottom half of the wire to be coated, said upper half having also recesses to produce upstanding foldable members of plastic material projecting upwardly on both sides of said depression,

b. withdrawing the upper half of the die, leaving in the bottom half the plastic element thus formed, which constitutes a tail portion and a bottom part of the V-portion, said last part having a central V-shaped depression corresponding to the lower half of the wire core of the IUD, and said foldable members extending up from said bottom part on either side of said depression,

c. placing the V-shaped metal wire core of the IUD in said depression so that it lies on the bottom thereof with said foldable members extending upwardly on either side of the wire to prevent its displacement,

d. replacing the upper half of the die with a second upper half die having an elongated cavity corresponding to the upper half of the product and forcing said second half die down into engagement with the lower half die so that its elongated cavity portion folds said foldable members inwardly over and around the top part of the wire to securely position the wire within the plastic and cause said members to interdigitate,

f. and injecting more plastic material through said upper half die to completely surround and enclose the wire and complete forming the IUD.

3,899,565

METHOD FOR FORMING TUBE WITH THICKENED SOCKET END

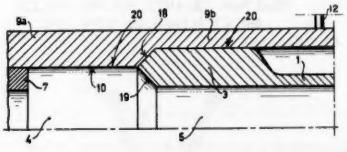
Warner Jan de Putter, Hardenberg, and Willem Cornelis den Hertog, Zwolle, both of Netherlands, assignors to Wavin B. V., Zwolle, Netherlands

Filed Apr. 18, 1973, Ser. No. 352,329

Claims priority, application Netherlands, Apr. 19, 1972, 7205280

Int. Cl. B29c *17/00;* **B29d** *23/00*

U.S. Cl. 264—296 **8 Claims**



1. Method for forming a socketed tube made of a plastic material which is rigid in an unheated condition, the tube having opposite inner and outer sides and being provided with a thickened end by deforming the tube which has been brought into a condition in which deformation is possible by applying heat, comprising the steps of:

a. heating the end part of the tube up to a temperature above the deformation temperature of the plastic material,

b. thickening this end part of the tube without substantially changing the diameter of the inner side by subjecting the same to an upsetting operation by deforming the tube between a first supporting wall positioned within the tube and a second supporting wall positioned outside of the tube, with the first and second walls being arranged with a predetermined spacing between them and so deforming the tube until the inner side and outer side of the thickened part are supported by the first and second supporting walls,

c. cooling at least the outer side of the thickened part of the tube down so as to have a temperature at least 10° lower than the temperature of the thickened mass so that on removal of the second supporting wall the thickened part substantially retains its form, while on the other hand cooling is performed such that after removal of the second supporting wall, the heat in a particular inner cross-sectional area suffices to bring this entire cross-sectional area up to at least the temperature of deformation; and

d. subsequently widening the thickened part to form a socket.

3,899,566

PROCESS FOR MANUFACTURING COLOR-STRIPED STAMPED DETERGENT BARS

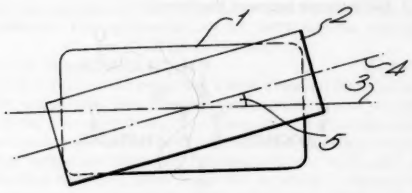
Graeme Douglas Murray, Newcastle upon Tyne, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 8, 1973, Ser. No. 386,655

Claims priority, application United Kingdom, Aug. 11, 1972, 37560/72

Int. Cl.² B29C *9/00*

U.S. Cl. 264—245 **4 Claims**



1. A process for manufacturing a soap or detergent bar having stripes of at least one distinctive color, curved relative to the long axis of the bar, which comprises feeding into a die box a longitudinally striped billet of soap or detergent, whose length is greater than the corresponding dimension of the die box, the billet being so aligned when it is forced into the die box that its long axis is not coincident with the long axis of the die box at the instant when it is subjected to compression therein, said long axis of the billet at said instant lying in a plane of a cross-section of the die box taken at right angles to the axis defined by the center of the open ends of the die box.

3,899,567

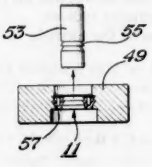
METHOD OF MANUFACTURING DYNAMIC PRESSURE SEAL

Gerald W. Gorman, Rt. 2, Box 320, Midlothian, Tex. 76065

Filed Aug. 12, 1974, Ser. No. 496,560

Int. Cl. B29c *7/00*

U.S. Cl. 264—318 **5 Claims**



1. A method of manufacturing an annular seal having protruding sealing lips that must not be damaged; said method combining both compression and transfer molding techniques and comprising the steps of repeating cycles, including:

a. assembling a mold by emplacing a stem within a press ring with said press ring being on the bottom, slipping a master ring over and conformingly engaging a portion of said press ring and concentrically about said stem so as to define a seal cavity, providing interior and exterior grooves in respective said stem and said master ring for forming said sealing lips, providing upwardly protruding teeth on said press ring such that a seal material forced into said seal cavity will have the desired shape of said seal, providing slots intermediate said teeth and disposed at an angle such that said seal is formed with no radial along which there is solid material in said seal between its interior wall and its exterior wall; and providing a compression ring for forcing seal material into said seal cavity;
b. heating said mold to a first predetermined temperature;
c. inserting into at least the top of said seal cavity a predetermined piece of seal material for forming said seal;
d. pressing said compression ring into conforming fit in the top of said cavity, thereby forcing by compression and transfer said seal material into said seal cavity to completely fill same in order to form said seal with its said sealing lips and ribs at an angle such that no radial has solid material intermediate the interior and exterior wall of said seal;
e. pressing, clamping and heating said mold and said seal at a vulcanizing temperature for a predetermined time interval sufficient to convert said seal material in the form of the raw said seal into a final vulcanized said seal;
f. unloading said seal by a critical series of steps that alleviates problems with damaging said seal; said steps being:
i. pulling out said compression ring from a first end of said master ring and the top of said seal cavity;
ii. removing said press ring from the second and opposite end of said master ring, thereby withdrawing said teeth from within said seal to allow said seal to flex and accommodate otherwise damaging deformation;
iii. removing said stem out of said second end of said master ring such that said groove on said stem slips out of engagement with said sealing lips of said seal by moving said sealing lips along an inclined surface instead of pulling against a surface inclined at 90° to the central longitudinal axis of said stem;
iv. removing said seal out of said first end of said master ring such that said sealing lips slip out of engagement with said grooves in said master ring by moving along an inclined surface instead of pulling against a surface inclined at 90° to the central longitudinal axis of said master ring; and
g. repeating said cycle.

3,899,568
ALUMINA REMOVAL FROM CHROMATE LEACH LIQUORS

Douglas G. Frick, Liverpool; Thomas R. Morgan, Solvay, and Terry L. Streeter, Syracuse, all of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

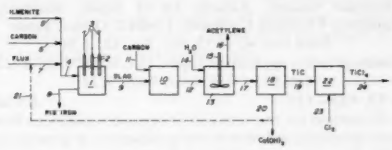
Filed June 12, 1974, Ser. No. 478,812
Int. Cl.[2] C01F 7/14; C01G 37/14
U.S. Cl. 423—55 **10 Claims**

1. In the process for removing dissolved aluminate from alkaline chromate leach liquor by acidification of the leach liquor to precipitate alumina hydrate, the improvement which comprises, in combination: (a) passing the leach liquor sequentially through a series of at least two agitated vessels; (b) maintaining the liquor at a temperature of at least about 90°C.; and (c) adding acidifying agent to said vessels in amount sufficient to establish gradually decreasing pH levels in the liquor from vessel to vessel in the direction of liquor flow such that the pH in the vessel through which the liquor passes first is maintained within the range of from 10 to 13.5, and the pH in the vessel through which the liquor passes last is maintained within the range of from 6 to 9.5, so that the precipitated alumina hydrate comprises predominantly alumina trihydrate.

3,899,569
PREPARATION OF HIGHLY PURE TITANIUM TETRACHLORIDE FROM ILMENITE SLAG

Willard L. Hunter; Jack C. White, and William A. Stickney, all of Albany, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 1, 1972, Ser. No. 222,503
Int. Cl.[2] C01G 23/02
U.S. Cl. 423—76 **7 Claims**

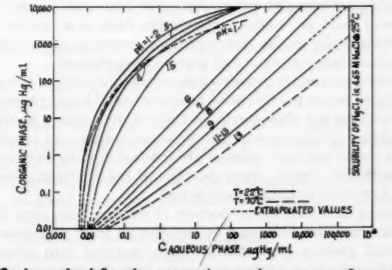


1. In a process for the production of titanium tetrachloride by the reaction of elemental chlorine with a titaniferous slag obtained from the smelting of ilmenite, the improvement comprising adding a fluxing agent selected from the group consisting of calcium oxide, calcium hydroxide, and limestone to the smelting charge in an amount sufficient to yield a titaniferous slag containing more than 10 percent calcium oxide by weight, reacting said titaniferous slag with carbon at temperatures above about 1,850°C to produce solid titanium carbide particles in a liquid calcium carbide matrix, cooling the mixture of calcium and titanium carbides, crushing the mixture, and reacting it with water to decompose the calcium carbide with the formation of acetylene and the release of titanium carbide particles from the calcium carbide matrix, separating the titanium carbide from solid residues produced in the decomposition reaction and reacting the recovered titanium carbide fraction with elemental chlorine while maintaining the chlorination temperature below the melting point of the impurity metal chlorides formed to produce titanium tetrachloride.

3,899,570
EXTRACTION OF MERCURIC CHLORIDE FROM DILUTE SOLUTION AND RECOVERY

Thomas W. Chapman, Madison, Wis., and Reinaldo Caban, Rio Piedras, P.R., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Feb. 9, 1973, Ser. No. 331,024
Int. Cl. C01g 13/00
U.S. Cl. 423—100 **14 Claims**



12. A method for the extraction and recovery of mercury from its ores the steps of treating the ore with an aqueous oxidizing halide solution for removal of the mercury as the solubilized halide, acidifying the solution to a pH within the range of 0.5–3.0, contacting the acidified aqueous solution

with an organic phase formed of an organic solvent solution of an alkyl amine selected from the group consisting of primary, secondary and tertiary amines in which alkyl groups are C_8 to C_{18} in the primary and secondary amines and C_6 to C_{18} in the tertiary amine, separating the organic phase from the aqueous phase, contacting the organic phase with an aqueous phase at a pH above 9 to extract the soluble mercuric salts from the organic phase at sufficiently high concentration for economic reduction to the metal mercury.

3,899,571

METHOD FOR THE REMOVAL OF ORGANIC SUBSTANCES FROM SODIUM ALUMINATE SOLUTION

Koichi Yamada; Tadanori Hashimoto, both of Nihama, and Kazuhiko Nakano, Katano, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 4, 1973, Ser. No. 421,638

Claims priority, application Japan, Dec. 6, 1972, 47-122189

Int. Cl.[2] C01F *7/04, 7/06, 7/34*

U.S. Cl. 423—127 **8 Claims**

1. A method for the removal of organic substances from a sodium aluminate solution in the production of alumina from bauxite in accordance with the Bayer process or improved processes thereof, characterized by adding sodium oxalate crystals as seeds to a sodium aluminate solution during the time period extending from after the aluminate hydroxide precipitation step to before the dissolution step, thereby precipitating organic substances mainly composed of sodium oxalate in said sodium aluminate solution; separating the crystals of organic substances from the sodium aluminate solution; washing the said separated crystals with an aqueous solution having a pH of 5 to 12 to remove substantially all of the organic substances newly deposited on the seeds from the separated crystals; and recycling the sodium oxalate crystals as seeds for precipitating organic substances after the removal of substantially all of the newly deposited organic substances.

3,899,572

PROCESS FOR PRODUCING PHOSPHIDES

Naozo Watanabe; Kenji Morizane, and Masaaki Ayabe, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 96,030, Dec. 8, 1970. This application July 19, 1972, Ser. No. 273,297

Claims priority, application Japan, Dec. 13, 1969, 44-100301; Dec. 13, 1969, 44-100303; Dec. 13, 1969, 44-100304; Dec. 13, 1969, 44-100305

Int. Cl. C01b *25/00*

U.S. Cl. 423—299 **12 Claims**

1. A process of producing a phosphide comprising:

positioning a suitable gaseous phosphorus-source material along a first lower portion of a reaction zone and positioning a select phosphide-forming material within a second lower portion of said reaction zone and below an upper portion of said reaction zone;

feeding an inert gas into said reaction zone and maintaining said inert gas within said reaction zone at a pressure at least equal to the decomposition pressure of the phosphide being produced at a given temperature;

cooling said upper portion of the reaction zone to a temperature below the inversion temperature of liquid phosphorus into red phosphorus and above the melting point of yellow phosphorus at the pressure within said reaction zone so that any gaseous phosphorus coming in contact with the cooled upper portion of the reaction zone is converted to liquid phosphorus;

heating said first lower portion of the reaction zone to a temperature sufficient to vaporize at least a portion of said gaseous phosphorus-source material into gaseous phosphorus at a pressure greater than the pressure of the inert gas at said lower portions of said reaction zone but below the pressure of the inert gas at the upper portion of the reaction zone so as to establish equilibrium pressure conditions within said reaction zone wherein at least a top portion of said upper portion of the reaction zone is composed of said inert gas and at least a top portion of said lower portions of the reaction zone are composed of gaseous phosphorus;

heating said second lower portion of the reaction zone to a temperature sufficient to initiate a reaction between said phosphide-forming material and gaseous phosphorus; and maintaining siad pressure-temperature conditions within said reaction zone for a period of time sufficient to produce said phosphide.

3,899,573

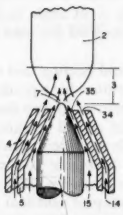
PRODUCTION OF FINE POWDERS

Henry Shaw, Scotch Plains, and Derek J. Angier, Somerville, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Oct. 18, 1971, Ser. No. 190,055

Int. Cl. B01k *1/00;* **C01b** *33/18;* **C01f** *7/02*

U.S. Cl. 423—337 **8 Claims**



1. In the process of comminuting a particulate inorganic oxide by vaporizing the inorganic oxide with a plasma jet and subsequently recondensing the vaporized inorganic oxide, the improvement comprising:

providing a free burning arc discharge between an anode and a cathode having a conical tip whereby said arc discharge forms a contraction zone of current-carrying area in the transition region in the vicinity of the cathode; forcefully projecting a particulate inorganic oxide along said conical tip of said cathode into and through said contraction of the current-carrying area into said arc discharge while simultaneously forcefully projecting a reducing agent along said conical tip of said cathode into and through said contraction of the current-carrying area into said arc discharge; and,

thereafter contacting the vapors with an oxygen containing quench gas.

3,899,574

METHOD FOR MAKING GRAPHITE FIBER AND RIBBON

Daniel E. Sliva, Pittsfield, Mass.; Charles M. Krutchen, and Ray W. Shade, both of Elnora, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 86,295, Nov. 2, 1970, abandoned. This application Apr. 20, 1973, Ser. No. 352,922

Int. Cl.[2] C01B *31/02, 31/04, 31/07*

U.S. Cl. 423—447 **7 Claims**

1. A method for making graphite fiber or ribbon which comprises

1. melt extruding at a temperature in the range of up to about 150°C, a polyacetylene-organic solvent blend comprising by weight

A. from 20 to 50% by weight of polyacetylene having an intrinsic visocity of 0.5 to 1.5 in ortho-dichlorobenzene at 120°C,

B. From 80 to 50% of organic solvent selected from the class consisting of para-dichlorobenzene, orthodichlorobenzene, nitrobenzene, and halogenated arylhydrocarbons having an average weight percent of chlorine

from about 12 to 75 percent, based on total weight of halogen, carbon and hydrogen where said blend is in the form of a free flowing powder, a wet granulated mixture or paste to produce a polyacetylene fiber or ribbon, where said polyacetylene is a member selected from the class consisting of

a. a copolymer consisting essentially of from 88 to 92 mole percent of chemically combined metadiethynylbenzene units and from 8 to 12 mole percent of para-diethynylbenzene units, and

b. a terpolymer consisting essentially of from 85 to 92 mole percent of chemically combined metadiethynylbenzene units, 4 to 10 mole percent of para-diethynylbenzene units and 2 to 6 mole percent of dipropargyl ether units of a bisphenol,

2. exposing the polyacetylene fiber or ribbon to a temperature of up to 1000°C to produce a heat treated fiber or ribbon having an elastic modulus greater than the extrudate of (1) and up to about 10×10^6 psi,

3. thereafter exposing the heat treated fiber or ribbon of (2) while under a tension of up to 1×10^5 psi and under non-oxidizing conditions to a temperature of up to about 3300°C to produce a graphite fiber or ribbon having an elastic modulus of at least about 20×10^6 psi.

3,899,575

PROCESS OF BAKING OR GRAPHITIZING CARBON MOLDINGS

Toshio Tokushige, and Motokiyo Nagayasu, both of Ehime, Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

Filed Mar. 21, 1973, Ser. No. 344,022

Claims priority, application Japan, Mar. 23, 1972, 47-29550; Jan. 22, 1973, 48-9733

Int. Cl. C01b *31/02, 31/04*

U.S. Cl. 423—448 **9 Claims**

1. In the process of baking or graphitizing carbon moldings covered with packing cokes at an elevated temperature, the improvement to reduce oxidation of the packing cokes which comprises covering the upper surfaces of the packing cokes with at least two layers of a refractory having sizes larger than the sizes of the packing cokes and sizes of at least about 5 mm but smaller than about 50 mm. and being durable to the temperature of the baking or graphitizing operation.

3,899,576

CYCLIC PROCESS FOR THE PRODUCTION OF HYDROGEN PEROXIDE

Rudolph Rosenthal, Broomall, and Joseph A. Kieras, Lincoln University, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 20, 1973, Ser. No. 389,935

Int. Cl.² C01B *15/02*

U.S. Cl. 423—586 **8 Claims**

1. A method for the production of hydrogen peroxide which comprises treating a peroxy titanium complex produced by reacting titanium sulfate with an organic hydroperoxide having from 4 to 12 carbon atoms and characterized by the formula ROOH wherein R is an alkyl, aralkyl or cycloalkyl radical at a temperature in the range of from 0°C. to 100°C., and at a pH of less than 1.5 and having one peroxy oxygen group per titanium atom with excess aqueous alkali metal hydroperoxide solution at a temperature in the range of from 0°C. to 60°C. for a time sufficient to obtain a solution of a complex containing more than one peroxy group per titanium atom and a titanium oxide precipitate, separating said precipitate, acidifying said complex solution containing more than one peroxy oxygen group per titanium atom to produce the titanium complex having one peroxy oxygen group per titanium atom and hydrogen peroxide and recovering the hydrogen peroxide from said complex solution.

3,899,577

CARBON MONOXIDE CONVERSION CATALYSTS

André Sugier, Rueil-Malmaison, France, assignor to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil-Malmaison, France

Division of Ser. No. 56,974, July 21, 1970, Pat. No. 3,787,332. This application Oct. 2, 1973, Ser. No. 402,762

Claims priority, application France, July 25, 1969, 69.25671

Int. Cl. C01b *1/03, 1/08*

U.S. Cl. 423—656 **19 Claims**

1. A process for manufacturing hydrogen by reacting carbon monoxide with steam at a temperature of from 150° to 450°C and in the presence of a catalyst comprising a mixed oxide of (a) copper and (b) at least one trivalent metal selected from the group consisting of aluminum, chromium, manganese, iron and cobalt, at least 60% by weight of said mixed oxide having a spinel structure.

3,899,578

GRISEOFULVIN COMPOSITIONS

Margaret Ellen Bird, and Norman Senior, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 245,658, April 19, 1972, abandoned. This application May 14, 1974, Ser. No. 469,860

Claims priority, application United Kingdom, May 24, 1971, 16624/71

Int. Cl.² A61K *31/78, 31/70*

U.S. Cl. 424—81 **4 Claims**

1. A gel consisting essentially of a solution of griseofulvin in a mixture of benzyl alcohol and dimethyl phthalate, a diluent selected from the group consisting of propylene glycol and glycerol, and a gelling amount of a gelling agent selected from the group consisting of carboxypolymethylene, hydroxyethylcellulose and sodium carboxymethylcellulose, said gel containing from 0.25 percent w/w to 5 percent w/w of griseofulvin, the amount of griseofulvin present being sufficient to treat a fungal skin infection effectively by topical application.

3,899,579

TREATMENT OF EMPHYSEMA, POLYARTHRITIS SYNDROME AND PECTIN RELATED DISEASES IN RUMINANTS

Eric C. Anderson, Box No. 1175, Bozeman, Mont. 59715

Filed Jan. 25, 1974, Ser. No. 436,604

Int. Cl.² A61K *31/70, 33/08, 33/14, 33/42*

U.S. Cl. 424—128 **3 Claims**

1. The method of controlling bloat in ruminants eating pectin containing plants comprising the steps of mixing in ratios of 100 pounds,

20 pounds of hydrated lime containing one part of hydrate magnesium oxide with substantially four parts of sodium chloride,

23 pounds of monosodium phosphate,

10 pounds of wheat bran,

10 pounds of dried molasses, and

32 pounds of salt,

and feeding said mixture to the ruminants, said mixture precipitating out pectin as calcium pectate and magnesium pectate.

3,899,580
ANTI-INFLAMMATORY TOPICAL GEL

Joseph L. O'Neill, Lafayette Hill, Pa., and Joseph V. Bondi, East Brunswick, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 267,743, June 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 261,186, June 9, 1972, abandoned. This application May 8, 1974, Ser. No. 467,982

Int. Cl.[2] A61K *17/16*

U.S. Cl. 424—241 **8 Claims**

1. A method of treating inflammation which comprises applying to the skin a topical formulation comprising a therapeutically effective amount of an anti-inflammatory agent selected from the group consisting of 2'-(4-pyridyl)-6,16α-dimethyl-11β,17α,21-trihydroxypregna-4,6-dieno-[3,2-c]-pyrazol-20-one, dexamethasone alcohol prednisolone alcohol and hydrocortisone alcohol in a clear water-white gel consisting of 0.05 percent by weidht of disodium edetate, from 8 to 18 percent by weight of water, from about 54 to about 84 percent by weight of a solvent selected from the group consisting of propylene glycol and mixtures thereof with isopropyl alcohol, and 2.6 percent by weight of hydroxypropyl cellulose.

3,899,581
TRIAMCINOLONE ACETONIDE DERIVATIVE

Agustin Agusti, Barcelona, Spain, assignor to J. Uriach & Cia S.A., Barcelona, Spain

Division of Ser. No. 452,322, March 18, 1974. This application Oct. 1, 1974, Ser. No. 511,075

Int. Cl.[2] A61K *17/00*

U.S. Cl. 424—241 **6 Claims**

1. A pharmaceutical preparation comprising as active ingredient triamcinolone acetonide 4,4'-methylene-bis(3-methoxy-2-naphthoate); and a pharmaceutically acceptable carrier.

3,899,582
AROMATIC IMIDOCARBONATE COMPOSITION AND METHOD OF USE FOR COMBATTING FUNGI

Shizuya Tanaka, Minoo; Toshiaki Ozaki; Akihiko Mine, both of Toyonaka; Katsutoshi Tanaka, Takarazuka; Sigeo Yamamoto, Toyonaka; Tadashi Ooishi, Takarazuka; Naganori Hino, Toyonaka, and Takeo Satomi, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

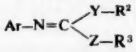
Division of Ser. No. 238,537, March 27, 1972, Pat. No. 3,832,351, which is a continuation-in-part of Ser. No. 133,744, April 13, 1971, abandoned. This application Jan. 31, 1974, Ser. No. 438,425

Claims priority, application Japan, Apr. 21, 1970, 45-34457; Nov. 22, 1971, 46-93874

Int. Cl. A01n *9/22*

U.S. Cl. 424—263 **4 Claims**

1. A fungicidal composition comprising as the active ingredient a fungicidally effective amount of an imidocarbonate derivative represented by the formula,



wherein Y and Z, which may be the same or different, are individually an oxygen or sulfur atom; Ar is an unsubstituted or a halogen-or lower C_1–C_4 alkyl(straight or branched)-substituted pyridine nucleus, the number of the substituents being 1 to 3;

R^2 is a C_1–C_{18} straight alkyl,

a C_1–C_6 branched alkyl,

a C_1–C_3 alkyl(straight or branched) having 1 to 2 hydroxy radicals provided that 2 hydroxy groups are not bonded to the same carbon atom or one alkoxy carbonyl(the alkoxy has 1 to 4 carbon atoms) radical in the carbon chain,

a cycloalkyl having up to 6 carbon atoms,

allyl,

propargyl,

a benzyl, the benzene nucleus of which may be unsubstituted or substituted by 1 to 4 halogen atoms, 1 to 4 lower C_1–C_4 alkyl(straight or branched) radicals or a nitro radical, or

a halogen- or lower C_1–C_4 alkyl (straight or branched)-substituted phenoxy-C_1–C_3 alkyl; and

R^3 is a C_1–C_3 alkyl(straight or branched) having 1 to 2 hydroxy radicals or one alkoxycarbonyl (the alkoxy has 1 to 4 carbon atoms) radical in the carbon chain,

allyl,

propargyl, or

a benzyl, the benzene nucleus of which may be unsubstituted or substituted by 1 to 4 halogen atoms, 1 to 4 lower C_1–C_4 alkyl(straight or branched) radicals, a nitro radical or a C_2–C_4 alkylene radical

and an inert carrier.

3,899,583
METHOD OF USING 6-SUBSTITUTED AMINO PHENYL-2,3,5,6-TETRAHYDRO-[2,1-B] THIAZOLES

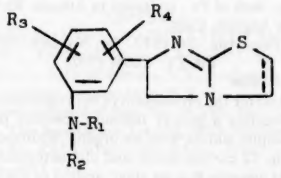
Larry Dean Spicer, Princeton, and John James Hand, Trenton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 289,016, Sept. 14, 1972, which is a continuation-in-part of Ser. No. 174,939, Aug. 25, 1971, abandoned, which is a continuation-in-part of Ser. No. 22,701, March 25, 1970, Pat. No. 3,673,205. This application Nov. 16, 1973, Ser. No. 416,464

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—270 **13 Claims**

1. A method for controlling gastrointestinal nematodes in warm-blooded animals comprising administering to said animals, a nematocidally effective amount of a compound of the formula:



wherein R_1 and R_2 are selected from the group consisting of hydrogen, alkyl C_1–C_{10}, alkenyl C_2–C_8, cycloalkyl C_3–C_7, hydroxy loweralkyl, loweralkanoyloxyloweralkyl, loweralkoxyloweralkyl, benzyl, substituted benzyl, phenylethyl, substituted phenylethyl, mono- and dinitrophenyl, R_5—C(O)— wherein R_5 is selected from the group consisting of hydrogen, alkyl C_1–C_9, alkenyl C_2–C_7, cycloalkyl C_3–C_7, haloalkyl C_1–C_8, aminoalkyl C_1–C_8, monoloweralkylaminoloweralkyl, diloweralkylaminoloweralkyl, loweralkoxyloweralkyl, phenyl, substituted phenyl, alkoxy C_1–C_8 amino, monoloweralkylamino or diloweralkylamino;

taken together is the group (loweralkyl)$_x$—NCH=N—; and R_3 and R_4 are selected from the group consisting of hydrogen, halogen and nitro; the term substituted represents monohalo, dihalo, trihalo, mononitro, dinitro, monoloweralkyl, diloweralkyl, triloweralkyl, monoloweralkoxy, diloweralkoxy, and triloweralkoxy; and halogen or halo is fluoro, chloro, bromo, or iodo; with the proviso that when R_3 and R_4 are both hydrogen, not more than one member from the group R_1 and R_2 can be hydrogen, is a single or double bond; and a pharmaceutically acceptable salt thereof.

3,899,584

4,5-BIS-(TRIFLUOROMETHYLIMINO)-THIAZOLIDINES AS FUNGICIDAL, INSECTICIDAL AND ACARICIDAL AGENTS

Hans-Joachim Scholl, Cologne; Erich Klauke, Odenthal; Ferdinand Grewe, Burscheid, and Ingeborg Hammann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

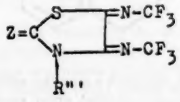
Continuation-in-part of Ser. No. 206,158, Dec. 8, 1971. This application Nov. 20, 1973, Ser. No. 417,703

Claims priority, application Germany, Dec. 18, 1970, 2062348

Int. Cl. A01n *9/12, 9/22*

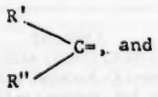
U.S. Cl. 424—270 **14 Claims**

1. A method of combating fungi, insects or acarids which comprises applying to such fungi, insects, acarids or a habitat thereof a fungicidally, insecticidally or acaricidally effective amount of a compound of the formula



in which

Z is R—N= or



and

R, R',R'' and R''' each is hydrogen; alkyl, alkenyl or alkynyl with up to 8 carbon atoms optionally substituted by halogen, cyano, lower alkoxy or alkylmercapto of up to 3 carbon atoms; cyclopentyl or cyclohexyl optionally substituted with alkyl of up to 3 carbon atoms, carbalkoxy having up to 8 carbon atoms in the alkoxy group; phenylalkyl or naphthylalkyl with up to 2 carbon atoms in the alkyl moiety; or phenyl or naphthyl radicals optionally being substituted by halogen, cyano, nitro, lower alkyl of up to 3 carbon atoms, haloalkyl of up to 8 carbon atoms, lower alkoxy or alkylmercapto of up to 3 carbon atoms.

3,899,585

FUNGICIDAL METHOD FOR PROTECTING A PLANT

Tomomasa Misato, Tokyo; Keng Tang Huang, Wako; Yasuo Homma, Fukuoka; Ryonosuke Yoshida, Kamakura; Tadaomi Saito, Yokohama, and Akira Shimizu, Kawasaki, all of Japan, assignors to Rikagaku Kenkyusho Ajinomoto Co. Ltd., Tokyo, Japan

Division of Ser. No. 219,550, Jan. 20, 1972, Pat. No. 3,821,403. This application Mar. 27, 1974, Ser. No. 455,343

Int. Cl. A01n *9/20, 9/24*

U.S. Cl. 424—274 **8 Claims**

1. A method of combatting bacteria or fungi on plants which comprises applying to said plants a bactericidally or fungicidally effective amount of a salt of C_{12} –C_{18} alkyl ester of DL- or β-alanine, said salt being selected from the group consisting of hydrochloric acid, sulfuric acid, nitric acid, acetic acid, oxalic acid, formic acid, butyric acid, lactic acid, p-toluenesulfonic acid and pyroglutamic acid.

3,899,586

SYNERGISTIC CHRYSANTHEMATE INSECTICIDES

Yoshitoshi Okuno, Toyonaka, and Masachika Hirano, Ashiya, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 16, 1974, Ser. No. 515,332

Claims priority, application Japan, Oct. 18, 1973, 48-117497

Int. Cl. A01n *9/22, 9/24*

U.S. Cl. 424—274 **9 Claims**

1. An insecticidal composition containing an inert carrier and as active ingredients an insecticidally effective amount of a mixture consisting of (1) N-(3,4,5,6-tetrahydrophthalimido)-methyl chrysanthemate or (2) 2-allyl-3-methyl-cyclopent-2-ene-1-one-4-yl chrysanthemate and (3) 3-phenoxybenzyl-2',2'-dimethyl-3'-(2'',2''-dichlorovinyl) cyclopropanecarboxylate wherein the ratio of compounds (1) or (2) to compound (3) is 2:8 to 8:2.

3,899,587

USE OF PROSTAGLANDINS E AND F FOR ABORTION

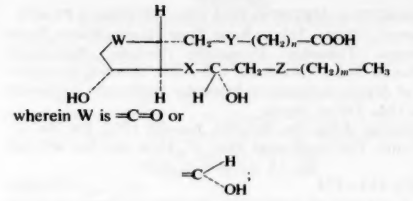
Bruce B. Pharriss, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 881,296, Dec. 1, 1969, abandoned, which is a continuation-in-part of Ser. No. 756,294, Aug. 29, 1968, abandoned. This application Sept. 24, 1973, Ser. No. 400,460

Int. Cl.[2] A61K *31/20, 31/215*

U.S. Cl. 424—305 **11 Claims**

1. A method of accomplishing a medical abortion in an ovulating human which consists essentially of providing to said human in a span of time beginning at about the time of implantation and ending at about the first 16 weeks of the gestation period an effective amount for accomplishing the medical abortion of a member selected from the group consisting of the free acids, pharmaceutically acceptable salts, and alkyl esters having 1 to 6 carbon atoms, inclusive, in the alkyl portion, of a compound represented by the formula



wherein X is $-CH_2CH_2-$ or trans—CH=CH— and Y and Z are $-CH_2CH_2-$, or wherein X is trans—CH=CH—, Y is cis—CH=CH—, and Z is $-CH_2CH_2-$ or cis—CH=CH—; and wherein *m* is 0, 1, or 2 and *n* is 2, 3, 4 or 5, in a dosage unit form compounded with pharmaceutical means which adapt the form for systemic administration.

3,899,588

ROT AND MILDEW PREVENTION EMPLOYING CERTAIN ALKANOIC ACID SALTS

Ebbe R. Skov, Middletown; Roderick B. Judge, Montclair, and Geoffrey Hemphill, Manasquan, all of N.J., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 304,462, Nov. 7, 1972, Pat. No. 3,786,086. This application Oct. 17, 1973, Ser. No. 407,106

Int. Cl. A01n 9/24

U.S. Cl. 424—317 **7 Claims**

1. A process for preparing a liquid solution useful for preventing rot and mildew from forming on silage or seeds comprising:

a. forming a first mixture by admixing water and an alkanoic acid having 2–10 carbons in a mixing and reacting zone having a cooling means, an upper portion, a lower portion, and an agitating means positioned in at least the lower portion, the mole ratio of water to alkanoic acid being 1:0.16–0.36;

b. feeding liquid anhydrous ammonia into the bottom of the mixing and reacting zone and agitating the first mixture and the resulting reacting mixture therein while maintaining the temperature of said reacting mixture at about 25°–95°C, the liquid anhydrous ammonia being added in an amount to provide about 0.85–0.95 moles of ammonia per mole of said alkanoic acid; and

c. removing the resulting liquid solution from the mixing and reacting zone and recovering said solution.

3,899,589

METHOD AND COMPOSITIONS FOR INDUCING RESISTANCE TO BACTERIAL INFECTIONS

Elton S. Cook, and Kinji Tanaka, both of Cincinnati, Ohio, assignors to Stanley Drug Products, Inc., Portland, Oreg.

Division of Ser. No. 138,331, April 28, 1971, Pat. No. 3,728,444, and a continuation of Ser. No. 341,079, March 14, 1973, abandoned. This application Mar. 18, 1974, Ser. No. 452,370

Int. Cl.[2] A61K 31/195

U.S. Cl. 424—319 **3 Claims**

1. A method of treating *Salmonella typhi* and *Staphylococcus aureus* infections in mammals comprising administering to a mammal suffering from said infection an antibacterial effective amount of cysteic acid.

3,899,590

TREATMENT OF HYPERLIPIDAEMIA

Seymour Jeffrey Corne, Kew, England, assignor to Aspro-Nicholas Limited, Slough, England

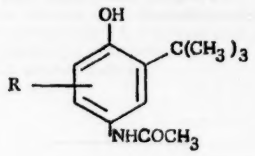
Filed Mar. 1, 1974, Ser. No. 447,453

Claims priority, application United Kingdom, Mar. 7, 1973, 11070/73; Mar. 7, 1973, 11071/73

Int. Cl.[2] A61K 31/165

U.S. Cl. 424—324 **8 Claims**

1. A method of reducing serum cholesterol in a mammal which comprises administering to the mammal in need thereof a cholesterol-reducing effective amount of a 3-tert.-butyl-4-hydroxyacetanilide of the formula:



wherein R is in the 5 or 6 position and represents a hydrogen atom or an alkyl group of one to four carbon atoms.

3,899,591

PREPARATION FOR TREATING PSORIASIS

Gunnar P. E. Swanbeck, Taby; Gösta L. Zetterberg, and Karl Hubert Agback, both of Uppsala, all of Sweden, assignors to Pharmacia Aktiebolag, Uppsala, Sweden

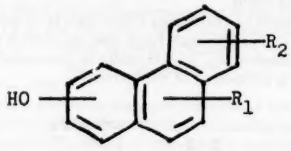
Filed June 21, 1974, Ser. No. 481,735

Claims priority, application Sweden, June 29, 1973, 7309193

Int. Cl. A61k 27/00

U.S. Cl. 424—346 **6 Claims**

1. A preparation for the treatment of psoriasis comprising 0.1 – 10 per cent of a compound having the formula



wherein R_1 and R_2 are each a member selected from the group consisting of hydrogen, methyl, ethyl, propyl, isopropyl, halogen, and methoxy; and a dermatologically acceptable carrier, said per cent being calculated on the total weight of the preparation.

3,899,592

SWEETENING AGENT

Tullo Suarez; Edmund C. Kornfeld, and Jack M. Sheneman, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 719,730, April 8, 1968, abandoned. This application Jan. 31, 1972, Ser. No. 222,373

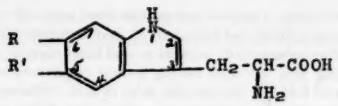
Int. Cl. A23l 1/26

U.S. Cl. 426—2 **33 Claims**

1. The method which comprises orally administering essentially simultaneously to a warm-blooded animal in which it is desired to limit caloric uptake, said animal being selected from the group consisting of human being and dog

1. an orally acceptable substance and

2. a non-nutritive sweetener which is the d-enantiomorph of a substituted tryptophane compound of the formula



or its non-toxic physiologically acceptable salts, wherein R represents halo of an atomic weight of less than 85, lower alkyl, lower alkoxy, or trifluoromethyl; and when R is trifluoromethyl, R′ represents hydrogen, or when R is halo as defined, lower alkyl, or lower alkoxy, R′ represents hydrogen, halo of an atomic weight of less than 85, lower alkyl, or lower alkoxy, said non-nutritive sweetener being administered in an amount sufficient to impart a desired degree of sweetness to the orally acceptable substance.

3,899,593

XYLITOL CHEWING GUM

John E. Hammond, Ridgewood, N.J., and Thomas K. Streckfus, Yonkers, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 102,139, Dec. 28, 1970, abandoned. This application June 24, 1974, Ser. No. 482,120

Int. Cl.[2] A23G *3/30*

U.S. Cl. 426—3 **8 Claims**

1. A sugarless chewing gum which presents a pleasant cooling effect in the mouth comprising on a weight basis xylitol 50 to 80% and gum base 18% to 30%.

3,899,594

FOOD PRESERVATION

John T. R. Nickerson, Somerville, and John R. Darack, Framingham, both of Mass., assignors to Dirigo Corporation, Boston, Mass.

Continuation of Ser. No. 180,099, Sept. 13, 1971, abandoned. This application Mar. 29, 1974, Ser. No. 456,181

Int. Cl.[2] A23L *1/31;* **A23B** *1/00, 7/00;* **A23L** *3/00*

U.S. Cl. 426—9 **3 Claims**

1. A method for safely extending the storage life of foods normally highly susceptible to common food-borne disease and common spoilage organisms selected from the group of foods consisting of custard filled foods, eclairs, fish fillets, potato salad, egg salad, cooked lobster meat, cooked peeled shrimp, chicken salad, squash pies, ham salad, lobster salad, shrimp salad, crab meat salad, and tuna salad, which method comprises adding to the food the combination of a composition which inhibits the growth of organisms and an inoculum, and permitting the inoculum to grow for a finite period of time until it causes an undesirable flavor in the food, thus causing the food to be discarded; said compound comprising an organic acid or salt thereof which inhibits the growth of common food-borne disease and spoilage organisms in the temperature range of approximately 40° to 86° F., but only slightly inhibits the growth of the inoculum at such temperatures; the inoculum being a non-pathogenic member of the Lactobacteriaceae which is characterized as growing in food in the temperature range of approximately 40° to 86° F.; said inoculum being either *Pediococcus cerevisiae* or *Lactobacillus viridescens* and said organic acid being a mixture of sorbic acid compound with propionate compound; said sorbic acid compound being either sorbic acid, potassium sorbate or sodium sorabte and said propionate compound being either sodium, calcium or potassium propionate; each said compound being present in said food at a concentration of at least 0.01%.

3,899,595

PROCESS AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF CURDS

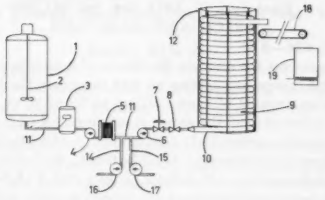
Pierre Stenne, Lozon, France, assignor to Claudel S.A., Hauts-de-Seine, France

Filed Sept. 4, 1973, Ser. No. 393,848

Claims priority, application France, Sept. 4, 1972, 72.31234; Apr. 16, 1973, 73.13766

Int. Cl. A23c *19/00*

U.S. Cl. 426—36 **20 Claims**



1. A process for the continuous production of curds for use in cheese making, wherein renneted or acidified milk or mixtures thereof is introduced under pulsation into a conduit whose wall is deformed under the effect of the pulsations and in which the curd is formed, and wherein the curd is collected at the outlet end of this conduit.

3,899,596

METHOD FOR THE MANUFACTURE OF CHEESES

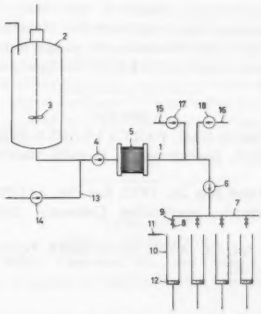
Pierre Stenne, Lozon, France, assignor to Claudel S.A., Courbevoie, France

Filed Apr. 10, 1974, Ser. No. 459,594

Claims priority, application France, Apr. 16, 1973, 73.13767; Aug. 16, 1973, 73.29866

Int. Cl. A23c *19/02*

U.S. Cl. 426—40 **10 Claims**



1. A process for the production of cheese which comprises treating milk by ultrafiltration to obtain as a sustained fraction a liquid product having a higher protein content than that of the milk, subjecting this liquid to a heat treatment to bring it to the coagulation temperature, renneting the liquid product after inoculation with suitable ferments, introducing a batch of the renneted liquid into at least one vertical chamber in which it is left to coagulate in the stationary phase until a coherent mass is obtained, displacing the coagulated mass obtained upwards under the effect of a pressure uniformly distributed over the base of the mass, and cutting unit slabs of coagulum which will each constitute a cheese at the top of the chamber after the mass has emerged by a predetermined height.

3,899,597

ALTERING RASPBERRY FLAVORED FOODSTUFFS WITH 4-(2,6,6-TRIMETHYL-1,3-CYCLOHEXADIEN-1-YL)-2-BUTANOL AND/OR 4-(6,6-DIMETHYL-2-METHYLENE-3-CYCLOHEXEN-1-YL)-2-BUTANOL, AND/OR ACETATES THEREOF

Braja Dulal Mookherjee, Matawan; Manfred Hugo Vock, Locust, both of N.J.; Carlos Benaim, Hartsdale, and Edward J. Shuster, Brooklyn, both of N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Apr. 17, 1974, Ser. No. 461,704

Int. Cl.[2] A23L *1/226, 1/235*

U.S. Cl. 426—538 **9 Claims**

1. A process for altering the flavor of a raspberry flavored foodstuff comprising adding to said raspberry flavored foodstuff in an amount of from 0.02 up to 50 ppm, an oxo compound selected from the group consisting of 4-(2,6,6-trimethyl-1,3-cyclohexadien-1-yl)-2-butanol, 4-(6,6-dimethyl-2-methylene-3-cyclohexen-1-yl)-2-butanol, 4-(2,6,6-trimethyl-1,3-cyclohexadien-1-yl)-2-butyl acetate and 4-(6,6-dimethyl-2-methylene-3-cyclohexen-1-yl)-2-butyl acetate, and mixtures thereof.

3,899,598

FORTIFIED GELATING DESSERT POWDER AND PROCESS

Valentine J. Fischer, Katonah; George Bernard Ponzoni, Spring Valley, and Charles J. Tressler, White Plains, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 15, 1974, Ser. No. 442,995

Int. Cl. A23l *1/30*

U.S. Cl. 426—73 **9 Claims**

1. Method for preparing a powdered, fortified gelatin dessert mix comprising the steps of:

a. dry blending gelatin and finely ground fumaric acid in order to effect coating of the gelatin with fumaric acid, said acid having a particle size less than 30 U.S. mesh,

b. blending sucrose, buffer salts, flavor, color and a vitamin premix with the gelatin-fumaric acid blend, said vitamin premix conntaining vitamin C, and then

c. dry blending adipic acid with the blend obtained from step b), the adipic-fumaric acid weight being from 10 to 35% fumaric acid and 65 to 90% adipic acid.

3,899,599

INFUSION BAG, PARTICULARLY FOR TEA

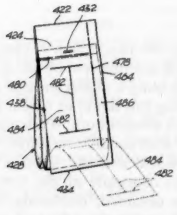
Adolf Rambold, Bachstrasse 8, D–4005 Meerbusch 1, Germany

Filed July 26, 1973, Ser. No. 382,885

Claims priority, application Germany, July 26, 1972, 2236616

Int. Cl.[2] A47G *19/16;* **B65B** *29/04*

U.S. Cl. 426—82 **16 Claims**



1. An infusion bag containing an infusible substance comprising a porous-walled container for the infusible substance, said container including an elongated head portion and at least two sides, a strip of non-porous sheet material secured to said head portion and folded about said container along a line extending substantially parallel to said head portion, said strip including side portions having lateral edges and extending from said fold line on opposite sides of said container, at least one of said side portions extending over substantially the entire length of said container adjacent the respective side thereof, said at least one side portion including a first prestamped scribe line extending parallel to said fold line, at least one additional prestamped scribe line extending from said fold line adjacent and parallel to one of said lateral edges and running over a predominant portion of said at least one side portion, said at least one additional scribe line intersecting said first scribe line and defining therewith, when said sheet material is cut along said scribe lines, a hanger having means adapted to be connected to a pour spout of a pot, said hanger remaining connected to said head after cutting of said lines by means of at least one narrow web defined in said at least one side portion between said at least one additional scribe line and the respective adjacent lateral edge of said at least one side portion.

3,899,600

ADDITIVE COMPOSITION FOR REDUCED PARTICLE SIZE MEATS IN THE CURING THEREOF

Clyde W. Sweet, Ann Arbor, Mich., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,440

Int. Cl.[2] A23L *1/31*

U.S. Cl. 426—532 **6 Claims**

1. A composition for addition to reduced particle size meats in the curing thereof in the absence of added nitrites comprising a mixture of tertiary-butylhydroquinone and one or more salts selected from the group consisting of edible sodium and potassium salts of phosphoric, polyphosphoric, pyrophosphoric, orthophosphoric and metaphosphoric acids, wherein the ratio in parts by weight of the salt to the tertiary-butylhydroquinone is 500/1 to 5/1.

3,899,601

DRY MIX FOR GLAZED CAKE

James H. Johannes, Minneapolis, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Dec. 3, 1973, Ser. No. 420,821

Int. Cl. A21d *13/00*

U.S. Cl. 426—554 **6 Claims**

1. A dry cake mix consisting essentially of:

about 22 to 30% wheat flour by weight of the dry cake mix composition, said wheat flour having a protein content of from about 8 to 10% by weight of the wheat flour,

about 40 to 50% sucrose by weight of the dry cake mix composition,

about 1 to 9% starch by weight of the dry cake mix composition, said starch being selected from wheat and corn starch,

about 18 to 21% plastic shortening by weight of the dry mix composition, said shortening having a solid fat index of about:

Temperature, °F.	SFI, %
50	29–33
70	21–24
80	19–22
92	14–17
104	8–10

and

about 1 to 2% by weight of a slow-acting baking powder blend.

3,899,602

INHIBITED STARCH PRODUCTS CONTAINING LABILE AND NON-LABILE CROSS-LINKS

Morton W. Rutenberg, North Plainfield; Martin M. Tessler, Edison, and Leo Kruger, Kendall Park, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 287,887, Sept. 11, 1972, Pat. No. 3,832,342. This application Apr. 5, 1974, Ser. No. 458,181

Int. Cl. A23l *1/14, 1/10*

U.S. Cl. 426—578 **8 Claims**

1. A food product containing a starch thickener characterized in that a substantial portion of said starch thickener is a dully inhibited starch having labile and non-labile cross-linkages wherein both the labile and non-labile cross-linkages remain substantially intact when said starch is cooked in pH 6.1 buffer at a temperature of 212°F for 20 minutes and only the non-labile cross-linkages remain substantially intact when said starch is retorted in pH 6.1 buffer at a temperature of 250°F for 15 minutes; and the viscosity of the retorted starch is higher than the viscosity of the cooked starch.

3,899,603

FRANKFURTER/HAMBURGER BUN

Merritt H. Brodie, 26 Laura Dr., Westbury, N.Y. 11590

Filed Oct. 12, 1973, Ser. No. 405,922

Int. Cl. A21d *13/00*

U.S. Cl. 426—138 **7 Claims**

1. A frankfurter or hamburger bun comprising a bread body having a pair of relatively flat opposed surfaces, one of said surfaces having a soft crust thereon, the other of said surfaces being substantially crust free, said bread body being elongated, a transversely extending centrally located groove in said bread body for permitting the folding of said bread body along said groove to bring the two sides of said uncrusted surface on opposite sides of said transverse groove into confronting relation, whereby to form a hamburger bun, and a longitudinally extending centrally located groove in said bread body for permitting the folding of said bread body along said longitudinal groove to bring the two sides of said uncrusted surface on opposite sides of said longitudinal groove into confronting relation, whereby to form a frankfurter bun.

3,899,604

PROCESS FOR THE PRODUCTION OF FOODS AND DRINKS WITH THE EMPLOYMENT OF MALTOBIONIC ACID

Toshio Miyake, and Yoshinori Sato, both of Okayama, Japan, assignors to Hayashibara Company, Okayama, Japan

Continuation of Ser. No. 94,526, Dec. 2, 1970, abandoned. This application Sept. 20, 1973, Ser. No. 399,097

Claims priority, application Japan, Dec. 4, 1969, 44-97374

Int. Cl.[2] A23L *1/26, 1/02, 1/24;* **A23G** *3/00*

U.S. Cl. 426—590 **5 Claims**

2. A method of imparting an acid taste to food products to which a component is customarily added to provide an acid taste which comprises:

adding unsubstituted maltobionic acid as the sole additive for providing said acid taste to the food products said acid being in a quantity sufficient to provide an acid taste thereto.

3,899,605

PROCESS OF PREPARING A FAT EMULSION

Johannes Emmus Schaap, Lunteren, Netherlands, assignor to Stichting Bedrijven van het Nederlands Instituut voor Zuivelonderzoek, Ede, Netherlands

Filed Sept. 5, 1973, Ser. No. 394,446

Claims priority, application Netherlands, Sept. 5, 1972, 7212074

Int. Cl. A23c *19/12*

U.S. Cl. 426—582 **8 Claims**

1. A process of preparing a fat emulsion by mixing

a. a milk fraction containing casein and having a low fat content and

b. an emulsified fat having been subjected to a treatment to divide it into finely dispersed particles, particularly globules, the size distribution of which approximately corresponds to that of fresh cow's milk, said treatment comprising the steps of mixing the fat prior to emulsifying at a temperature up to 50°C., with whey originating from the making of cheese, subjecting the mixture to a shearing action until the fat has been divided in particles (predominantly globules) having a diameter of from 1 ½ – 6 μm and an average of 3 μm, and subsequently mixing said blend with said milk fraction containing casein and having a low fat content.

3,899,606

PROCESS FOR THE TREATMENT OF COCONUT AND FOOD PRODUCTS RESULTING THEREFROM

John H. Forkner, Fresno, Calif., assignor to The Pillsbury Company, Minneapolis, Minn.

Continuation of Ser. No. 240,191, March 31, 1972, abandoned. This application Mar. 20, 1974, Ser. No. 452,740

Int. Cl.[2] A23L *1/36*

U.S. Cl. 426—250 **28 Claims**

1. In a process for the treatment of particulate coconut meat that is characterized by aligned rod-like cells arranged in cell bundles, immersing the particulate coconut meat in a water solution of a physiologically acceptable acid at an elevated temperature and at a pH and for a period of time sufficient to effect disruption of cells and loosening of the cells with respect to each other.

3,899,607

SIMULATED BONE

Timothy A. Miller, Ferguson, Mo., and Carlo J. Hansen, Waterloo, Ill., assignors to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 174,569, Aug. 24, 1971, abandoned. This application Sept. 10, 1973, Ser. No. 395,479

Int. Cl. A23k *1/20*

U.S. Cl. 426—285 **7 Claims**

1. A process for the production of a simulated bone having a structural matrix comprising a substantially unpuffed, farinaceous material consisting of the following steps:

a. forming a dough mixture which comprises about 50 to 75% by weight farinaceous material, a fat in an amount of between about 5 to 15% by weight of said dough, and water in an amount of between about 15 to 45% by weight of said dough;

b. working and shaping the dough at a temperature of between about 170° to 220°F. to form said bone; and

c. drying said bone to a moisture content of between about 5 to 12% by weight.

3,899,608

METHOD FOR CHEMICALLY PEELING FRUITS AND VEGETABLES

Salvador Forroll Soler, San Cugat Del Valles, Spain, assignor to Establissements du Paroy, Gentilly, France

Filed Aug. 16, 1973, Ser. No. 388,981
Claims priority, application Spain, Aug. 19, 1972, 406358
Int. Cl.[2] A23L *1/212*
U.S. Cl. 426—287 8 Claims

1. A method of chemically removing the skins of fruits and vegetables, which comprises dipping the fruits and vegetables for a period of 1 to 30 minutes in a composition kept at a temperature within the range of 60° to 100°C., said composition being an aqueous solution comprising 0.5 to 15% by weight of an ammonium salt of an inorganic acid having a pH value of 7 to 9.5 at 20°C. selected from the group consisting of monoammonium orthophosphate, diammonium orthophosphate, triammonium orthophosphate, mixed salts of ammonium and of an alkali metal base of orthophosphoric acid, ammonium carbonate, and mixtures of these ammonium salts.

3,899,609

PROCESS FOR CHEMICALLY BONDING ANIMAL PROTEIN TO PEELED KERNELS OF CEREAL GRAINS

Neal A. Lonneker, Star Rte., Prescott, Wash. 99348; Herman H. Miller, Jr., 13880 S.W. Hargis Rd., Beaverton, Oreg. 97005, and George M. Pigott, 5834 N.E. 181st St., Seattle, Wash. 98133

Continuation-in-part of Ser. Nos. 734,529, June 5, 1968, abandoned, and Ser. No. 179,150, Sept. 9, 1971, abandoned. This application Jan. 4, 1974, Ser. No. 430,747
Int. Cl.[2] A23J *3/00;* A23L *1/172*
U.S. Cl. 426—287 4 Claims

3. A process for chemically bonding animal protein to peeled kernels of wheat, comprising the steps of:

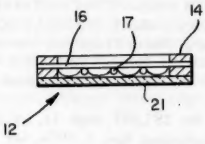
a. immersing whole kernels of wheat in water having a temperature up to 180°F;
b. draining the whole kernels of wheat;
c. applying an alkali solution in a 20 to 50% range of concentration by weight utilizing 1 U.S. gallon of the alkali solution to a pound of wheat, exposing all kernels of wheat to the alkali to remove the testa and germ and to relax the starch structure of the whole wheat kernels;
d. draining the alkali solution from the wheat kernels;
e. placing the wheat kernels into water to stop the alkaline action;
f. draining said whole wheat kernels and their still remaining diluted alkaline solution to remove the excess water, alkali, testas and germs;
g. shaking and spraying with water the drained whole wheat kernels to further stop the alkaline action yet allowing the then peeled kernels of wheat to retain their alkaline surface;
h. placing both the wheat kernels while still warm, swelled and open and the animal protein concentrate into a coating-predryer apparatus in which the animal protein concentrate contacts the gelatinized surface of the peeled wheat kernels and is held in and on the aleurone layer of the whole wheat kernels;
i. contacting said coated whole wheat kernels with a warm dilute solution of acetic acid;
j. draining and rinsing the whole wheat kernels with warm water; and
k. finally drying the protein fortified peeled wheat kernels for a period of time sufficient to reduce the moisture content to below 15%, using drying temperatures ranging between 120° to 180°F.

3,899,610

MEANS FOR PREPARING CELLS FOR INSPECTION

Donald E. Henry, 983 Memorial Dr., Cambridge, Mass. 02138

Filed Jan. 7, 1974, Ser. No. 431,167
Int. Cl. G02b *21/34*
U.S. Cl. 427—2 11 Claims



1. In a process for preparing cells for microscopic examination comprising the steps of (a) forming a suspension of said cells in a liquid suspension medium, and (b) forming a shallow pool of said suspension on a slide, and (c) evaporating the liquid medium from said suspension

the improvement comprising the steps of inducing menisci across the surface of said pool as the liquid suspension medium evaporates, utilizing the collapse of said menisci to avoid agglomeration and piling up of said cells on said slide and thereby facilitate the examination of said cells.

3. A process as defined in claim 1 wherein a radiant-heat absorbing surface is positioned beneath said transparent slide to modify the evaporation steps so cells are preferentially distributed in areas which are congruent with areas of the slide beneath the pool which are incongruent with said radiant-heat-absorbing surface.

3,899,611

CURING BY ACTINIC RADIATION

Roger P. Hall, Middleburgh Hts., Ohio, assignor to SCM Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 255,365, May 22, 1972, abandoned. This application Oct. 19, 1973, Ser. No. 408,244
Int. Cl.[2] C08F *8/00;* B05C *5/00*
U.S. Cl. 427—54 4 Claims

1. A coating composition polymerizable by actinic radiation which comprises in parts by weight the following components:

A. about 10 to 70 parts of an acrylyl terminated prepolymer having a molecular weight from about 170 to about 30,000;

B. about 5 to 75 parts of an alkyl acrylate melamine ether containing an average of more than 3 acrylate or lower alkacrylate groups per triazine ring and miscible with the acrylyl terminated prepolymer;

C. about 0 to 75 parts of a monoethylenically-unsaturated viscosity-reducing dilutent miscible with, and copolymerizable under actinic irradiation with, the prepolymer and the melamine ether; and

D. an actinic radiation-sensitive polymerization initiator in an proportion effective for initiating polymerization of said components (A), (B) and (C) upon exposure of said composition to actinic radiation, said proportion being from about 0.01 to 5 parts;

wherein said parts of said components (A), (B), (C) and (D) total 100.

3,899,612

METHOD OF PREPARING MOULDS FOR CASTING METALS

Harold Garton Emblem, Mirfield, England, assignor to Zirconal Processes Limited, Bromley, England

Filed Oct. 2, 1973, Ser. No. 402,785
Claims priority, application United Kingdom, Aug. 1, 1973, 36641/73
Int. Cl.² B05D 1/38
U.S. Cl. 427—133 3 Claims

1. A method of preparing a mould suitable for use in the casting of metals, such method including the steps of coating an expendable pattern with a composition consisting essentially of a finely divided refractory powder dispersed in an aqueous alcoholic solution of an aluminum hydroxyhalide of the general formula $Al_2(OH)_nX_{(6-n)}{\cdot}mH_2O$ or a polymer thereof, where n is a number less than 6, m is a number less than 4 and X represents a chlorine, bromine or iodine atom, dusting a coarse refractory material onto the wet coating and then hardening the coating by contacting it with ammonia vapor.

3,899,613

STATIC CHARGE PREVENTING METHOD FOR ACETYLCELLULOSE MOLDINGS

Takayuki Inayama, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 5, 1973, Ser. No. 413,064
Claims priority, application Japan, Nov. 4, 1972, 47-110504
Int. Cl.² C08J 1/38; C04B 35/68
U.S. Cl. 427—133 12 Claims

1. A method of preventing static charge accumulation on acetylcellulose resin moldings comprising applying a perchlorate in an amount of from 2–15 percent by weight based on the weight of said acetylcellulose resin and a plasticizer in an amount of 5–20 percent by weight based on the weight of said acetylcellulose resin to acetylcellulose moldings, said perchlorate and plasticizer being applied in a sufficient amount in combination to impart anti-static properties to said acetylcellulose moldings.

3,899,614

METHOD OF PRODUCING BUNDLED MULTIFILAMENT YARN

Tsuyoshi Okamoto; Yoichi Kawaguchi, and Takayuki Kai, all of Tsuruga, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Mar. 11, 1974, Ser. No. 450,240
Claims priority, application Japan, Mar. 10, 1973, 48-28199
Int. Cl.² C08J 5/04
U.S. Cl. 427—175 5 Claims

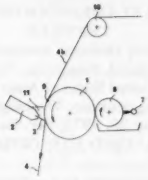
1. A method of producing bundled multifilament yarn which comprises depositing a rosin ester of a random copolymer of ethylene oxide and propylene oxide on the surface of a synthetic fiber multifilament yarn in an amount of more than 0.1% by weight based on the weight of the yarn, said random copolymer having an average molecular weight of 5,000 to 20,000 and wherein the ratio of ethylene oxide to propylene oxide in the copolymer is 50–85 mol % of ethylene oxide to 15–50 mol % of propylene oxide.

3,899,615

METHOD OF COATING PAPER OR OTHER SHEET MATERIAL WITH SURFACE LAYERS OF DIFFERENT COATING COMPOSITIONS

Hans Ivar Wallstén, Saffle, Sweden, assignor to AB Inventing, Saffle, Sweden

Filed Feb. 28, 1973, Ser. No. 336,777
Claims priority, application Sweden, Mar. 13, 1972, 3150/72
Int. Cl.² B05C 9/04
U.S. Cl. 427—211 2 Claims



1. A method of coating paper or other sheet material with surface layers by applying different coating compositions to both sides of a moving sheet by feeding the sheet between two opposed members defining a press nip formed of a resilient thin blade having a sharp edge comprising one member of the press nip and a rotatable roller supporting the sheet on one side comprising the other member of the press nip, said steps comprising:

applying a first coating composition to one side of the sheet by means of contact transfer of said first coating composition, which is applied to the surface of said roller; said first coating applied to said roller being limited laterally so that the width of the applied layer is narrower than the width of the sheet;

applying a second coating composition to the other side of the sheet from a dam arranged above the press nip and defined on one side by the sheet and on the other side by the blade; said sheet being brought into engagement with the surface of said roller before entering said nip to prevent the first coating composition from entering the dam and thus being mixed with the second coating composition in said dam.

3,899,616

FUNGISTATIC FABRIC TREATMENT

Frank A. Simonelli, 2731 Ironwood Dr., Springfield, Ohio 45504

Filed Nov. 9, 1973, Ser. No. 414,350
Int. Cl.² A61L 13/00; D06M 13/02
U.S. Cl. 427—242 4 Claims

4. A cloth treated by the process of claim 1 so as to be free from bacterial and fungal attack, said cloth containing 0.05 – 0.1% residual undecylenic acid after treatment.

3,899,617

PROCESS FOR CONDITIONING ABS RESIN SURFACE

Constantine I. Courduvelis, Athens, Greece, assignor to Enthone, Incorporated, West Haven, Conn.

Filed July 19, 1973, Ser. No. 380,634
Int. Cl.² B44D 1/18
U.S. Cl. 427—304 14 Claims

1. A process for conditioning surfaces of acrylonitrile-butadiene-styrene copolymers which comprises etching the acrylonitrile-butadiene-styrene copolymer surface by contacting the surface with a strong acid oxidizing solution at a temperature in the range of room temperature to up to but below the softening temperature of the acrylonitrile-butadiene-styrene copolymer, and contacting the thus-etched acrylonitrile-butadiene-styrene copolymer surface with an aqueous solu-

tion of a soluble alkanol amine wherein the alkanol radical contains from 2 to 3 carbon atoms at a temperature in the range of room temperature up to but below the softening temperature of the acrylonitrile-butadiene-styrene copolymer for a time sufficient to materially improve adhesion to said surface of electrolessly deposited metal, the aqueous alkanolamine solution having an alkanolamine concentration of from about 1% to about 50% by weight.

3,899,618
PROCESS FOR FLAMEPROOFING CELLULOSIC TEXTILES

Donald J. Daigle, New Orleans; Armand B. Pepperman, Jr., Metairie, and Gordon J. Boudreaux, New Orleans, all of La., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 20, 1974, Ser. No. 471,516

Int. Cl.[2] C09D *5/18;* **C07D** *295/00*

U.S. Cl. 427—396 **1 Claim**

1. A process for imparting to a cellulosic textile the quality of flame retardancy, comprising: (a) impregnating the cellulosic textile with a dimethyl sulfoxide solution containing about 15% by weight of a phosphine compound selected from the group consisting of 2-thia-1,3,5-triaza-7-phosphaadamantane 2,2-dioxide, 2-thia-1,3,5-triaza-7-phosphaadamantane 2,2,7-trioxide, and 2-thia-1,3,5-triaza-7-phosphoniaadamantane 2,2-dioxide iodide to a wet pickup of about 80%, and (b) drying the wet impregnated textile for about 5 minutes at about 80°C to obtain a treated fabric with about 12% weight gain.

3,899,619
1,3,5-TRIAZA-7-PHOSPHAADAMANTANE AND DERIVATIVES AS FLAME RETARDANTS FOR TEXTILES

Donald J. Daigle, New Orleans; Armand B. Pepperman, Jr., Metairie, and Sidney L. Vail, New Orleans, all of La., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 24, 1973, Ser. No. 391,189

Int. Cl.[2] C09D *5/18;* **C09K** *3/28*

U.S. Cl. 427—396 **5 Claims**

1. A process for imparting to a cellulosic textile the quality of flame retardancy, comprising: (a) impregnating the cellulosic textile with an aqueous solution containing about 15% by weight of a phosphine compound selected from the group consisting of 1,3,5-triaza-7-phosphaadamantane, 1,3,5-triaza-7-phosphaadamantane 7-oxide, 1-methyl-1-azonia-3,5-diaza-7-phosphaadamantane iodide, and 1-methyl-1-azonia-3,5-diaza-7-phosphaadamantane 7-oxide iodide to a weight pickup of about 80%, and (b) drying the wet impregnated textile for about 5 minutes at about 80°C to obtain a treated fabric with about 12% weight gain.

3,899,620
CAMOUFLAGE NETTING

Johannes Franciscus Roeloffzen, Sas van Gent, Netherlands, assignor to Spectrum N.V., Sas van Gent, Netherlands

Filed Apr. 14, 1972, Ser. No. 244,106

Claims priority, application Netherlands, Apr. 23, 1971, 7105590

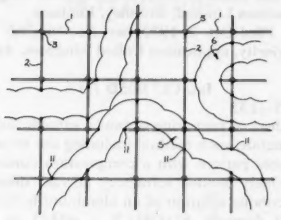
Int. Cl.[2] D04G *1/00*

U.S. Cl. 428—112 **16 Claims**

1. A camouflage unit comprising:

a. a supporting net;

b. a plurality of trimming strips randomly disposed through said supporting net, said trimming strips formed from a supporting layer and first and second covering layers, said first covering layer disposed on one side of said supporting layer, and said second covering layer disposed on the opposite side of said supporting layer, said first and second covering layers comprised of randomly arranged, nonwoven bound together vegetable fibers.



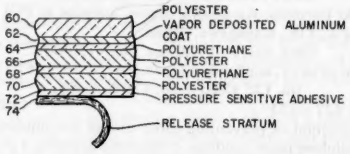
3,899,621
SECURITY FILM FOR SHATTER-PROOFING WINDOWS

Michael E. Willdorf, Malden, Mass., assignor to Material Distributors Corporation, Woburn, Mass.

Continuation-in-part of Ser. No. 113,426, Feb. 8, 1971, Pat. No. 3,775,226. This application Oct. 10, 1972, Ser. No. 295,816The portion of the term of this patent subsequent to Nov. 27, 1990, has been disclaimed.

Int. Cl.[2] B44F *1/100*

U.S. Cl. 428—216 **7 Claims**



1. An assemblage consisting of only one sheet of window glass and a security film, said security film comprising an assemblage of strata including at least one first polyester support stratum, at least one second polyester support stratum, at least one elastomeric bonding stratum, and only one pressure sensitive adhesive stratum, said one first polyester support stratum and said one second polyester stratum each being composed of polyethylene terephthalate and ranging from 0.5 to 5 mils in thickness, said one elastomeric bonding stratum being composed of polyurethane and being interposed between said one first polyester support stratum and said one second polyester support stratum and in direct contact with the inner faces of said one first polyester support stratum and said one second polyester support stratum, said polyurethane bonding stratum ranging in thickness from 0.2 to 0.4 mil, said pressure sensitive stratum being coated on one of the outer faces of said assemblage and being adhered to said only one face of only one sheet of window glass, said pressure sensitive stratum being composed of a composition including a rubber and a tackifier and ranging in thickness from 0.5 to 1.5 mil, all of the strata of said assemblage being optically clear and moisture permeable, and a light transmitting aluminum coat that is vapor deposited on one inner face of said one first polyester stratum and said one second polyester stratum, said vapor deposited aluminum coat being characterized by a visible light transmission ranging from 5 to 60% and a thickness of no more than 300 angstrom units, at least one of said one first polyester stratum and said one second polyester stratum containing an ultraviolet absorbing dye.

2. A security film for application to only one face of only one sheet of window glass, said security film comprising an assemblage of strata including at least one first polyester support stratum, at least one second polyester support stratum, at least one elastomeric bonding stratum, and only one

pressure sensitive adhesive stratum, said one first polyester support stratum and said one second polyester stratum each being composed of polyethylene terephthalate and ranging from 0.5 to 5 mils in thickness, said one elastomeric bonding stratum being composed of polyurethane and being interposed between said one first polyester support stratum and said one second polyester support stratum and in direct contact with the inner faces of said one first polyester support stratum and said one second polyester support stratum, said polyurethane bonding stratum ranging in thickness from 0.2 to 0.4 mil, said pressure sensitive stratum being coated on one of the outer faces of said assemblage for adhesion to said only one face of only one sheet of window glass, said pressure sensitive stratum being composed of a composition including a rubber and a tackifier and ranging in thickness from 0.5 to 1.5 mil, all of the strata of said assemblage being optically clear and moisture permeable.

3,899,622

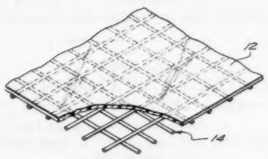
LAMINATED FABRIC

David H. Geiger, 125 Grandview Dr., Toms River, N.J. 13905

Filed July 20, 1973, Ser. No. 381,065

Int. Cl.[2] B32B *7/04, 31/06*

U.S. Cl. 428—245 **19 Claims**



1. A composite sheet material comprising a foraminous web formed of a plurality of fibers defining a plurality of openings in the web and a thin film of transparent polytetrafluoroethylene sheet material having a pair of opposite sides, said fibers being coated with polytetrafluoroethylene, and said polytetrafluoroethylene sheet being secured on one side thereof to said polytetrafluoroethylene coating on said fibers and extending across said openings to form said composite sheet and whereby said composite sheet is transparent.

13. The sheet material as defined in claim **12** wherein said inner coating has a plurality of glass beads embedded therein.

3,899,623

SYNTHETIC LEATHER COMBINATION OF NEEDLE-PUNCHED FABRIC AND POLYETHERESTER POLYURETHANE

Kaoru Okazaki; Kenkichi Yagi, both of Otsu; Akira Ichimura, Kyoto, and Yoshinori Masubuchi, Nagoya, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

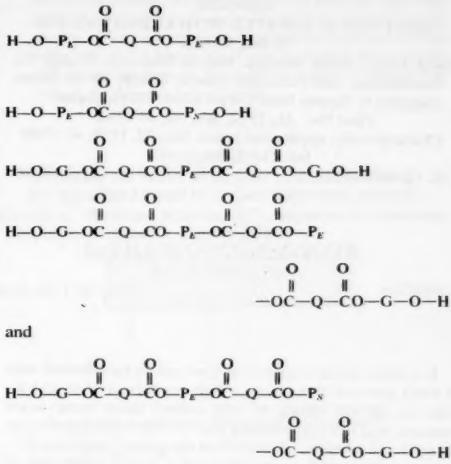
Continuation of Ser. No. 242,819, April 10, 1972, abandoned. This application July 31, 1974, Ser. No. 493,402

Int. Cl.[2] C08G *22/10*; **B44D** *1/40*

U.S. Cl. 428—290 **25 Claims**

1. Sheet material comprising a needle punched non-woven fabric and a substantially linear polyurethane elastomer produced by the process of reacting

a. a linear block copolymer diol selected from the group consisting of the formula

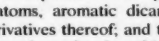


and

in which —O—P_E—O— is a polytetramethyleneether glycol residue having a molecular weight of at least about 1,000; —O—P_S—O— is a residue of polyester glycol of a molecular weight of at least about 300 and selected from the group consisting of polyesters made by the condensation of organic dicarboxylic acids and low molecular weight glycols, and polyesters made by the ring opening polymerization of lactones; —O—G—O— is glycol residue having a molecular weight of below about 500;

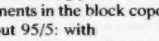
is an organic dicarboxylic acid residue selected from the group consisting of an aliphatic dicarboxylic acid having from 2 to 10 carbon atoms, aromatic dicarboxylic acid and ester formable derivatives thereof; and the weight ratio of polytetramethyleneether glycol residue (—O—P_E—O—) to other components in the block copolymer diol is from about 55/45 to about 95/5: with

b. a molar excess of an organic diisocyanate of the formula



wherein R_2 is a residue of aliphatic or aromatic diisocyanate, and further reacting the resulting isocyanate-terminated intermediate by the reaction of (a) and (b) with

c. a difunctional chain extender of the formula



wherein R_1 is a residue of alkylene diamine or arylene diamine or alkylene glycol or alkanol amine, the molar ratio of (a) + (c) : (b) being about 1:1.

3,899,624

METHOD FOR PROTECTING SURFACES AGAINST ENVIRONMENTAL DAMAGE AND THE RESULTANT PRODUCTS

William M. Sutherland, San Diego, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Filed Apr. 26, 1973, Ser. No. 354,601

Int. Cl.[2] B32B *15/08*

U.S. Cl. 428—327 **4 Claims**

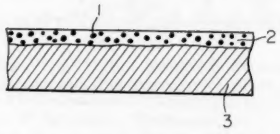
1. A protective finish comprising a substantially continuous adherent film over a surface to be protected comprising small particles of a cation exchange resin regenerated with protective ions comprising zinc ions, and a resinous film forming agent whereby corrosion and fouling of said surface is reduced when the coated surface is exposed to the environment.

3,899,625

SHEET METAL TREATED WITH LUBRICANT FOR PRESS WORK

Soichi Izumi; Takeo Ashiura, both of Muroran; Yoshiji Ito, Noboribetsu, and Nobutaka Miura, Tokyo, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 21, 1972, Ser. No. 317,142
Claims priority, application Japan, Dec. 27, 1971, 47-1988
Int. Cl.[2] B32B *15/08*
U.S. Cl. 428—457 2 Claims



1. A sheet metal coated on at least one surface thereof with a dried lubricant film having a high coefficient of static friction to prevent sliding of said coated sheet metal when stacked, said film comprising a discrete lubricant dispersed in at least one member selected from the group consisting of

a. a water soluble resin which has a higher coefficient of static friction than said lubricant, and

b. a water dispersible resin containing carboxylic groups and having an acid value of about 30 to 400 and a glass transition temperature of 35°C. or less,

said discrete lubricant being selected from at least one member of the group consisting of solidified to semi-solidified waxes, higher fatty acids, esters of higher fatty acids and metallic salts of higher fatty acids, wherein the weight ratio of said resin to said discrete lubricant is between 0.05 and 10.

3,899,626

COMPOSITE ARTICLES BASED ON HEAT-RESISTANT RESINS

Joseph Steffen, Tassin, France, assignor to Rhone-Poulenc, S.A., Paris, France

Filed Sept. 7, 1973, Ser. No. 395,156
Claims priority, application France, Sept. 11, 1972, 72.32138
Int. Cl. B32b *27/34, 3/12;* C09j *5/00*
U.S. Cl. 428—474 14 Claims

1. Process for the manufacture of a composite article which comprises stacking at least one layer (a) comprising a prepolymer of a bis-imide and a polyamine, and at least one layer (b) of a solid material, and then pressing the resulting stack, under the following conditions:

i. the layers are positioned such that when two or more layers (b) are used, said layers (b) are separated from each other by at least one layer (a);

ii. before the layers are positioned a polyamide-imide solution is applied over at least a part of the surfaces to be brought into contact such that when a surface of a layer (a) is to be positioned adjacent a layer (b) at least one of said surfaces is coated; and

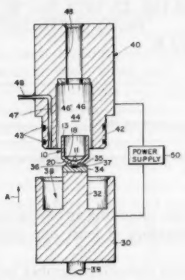
iii. the concentration of the polyamide-imide in the solution does not exceed about 70% by weight at the time of stacking.

14. A composite article manufactured by a process as defined in claim 1.

3,899,627
CRUCIBLE

George J. Sitek, Stevensville, and Charles W. Berk, St. Joseph, both of Mich., assignors to Leco Corporation, St. Joseph, Mich.

Filed June 28, 1974, Ser. No. 484,303
Int. Cl. F27b *14/10*; H05b *3/00*
U.S. Cl. 13—22 10 Claims

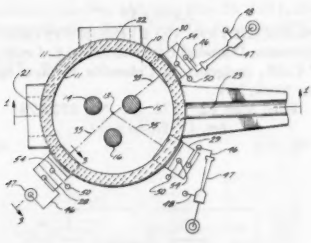


1. A resistance heating crucible made of a conductive material for fusion of a specimen and comprising a cylindrical side wall having an open end defining the top of said crucible and an enclosed end defining the bottom of said crucible, wherein the interior of said bottom is concavely rounded and the junction of the exterior of said side wall with the bottom is chamfered to reduce the cross-sectional area of the electric current path through said bottom of said crucible.

3,899,628
ELECTRIC ARC FURNACE WITH AUXILIARY BURNERS

John H. Hirt, Monterey Park, Calif., assignor to Southern California Gas Co., Los Angeles, Calif.

Filed Sept. 4, 1973, Ser. No. 393,719
Int. Cl. H05b *7/00*
U.S. Cl. 13—2 15 Claims

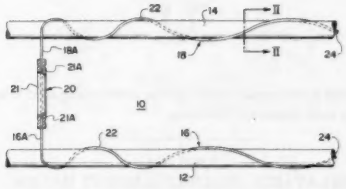


1. An electric arc furnace comprising:
a furnace having a hearth, a side wall surrounding the hearth, and a roof over the side wall to define a generally cylindrical enclosure with a vertical central axis;
a plurality of electrodes extending vertically through the roof into the center of the enclosure;
a source of carbonaceous fluid fuel;
a source of oxygen;
means for mixing the fuel and the oxygen to form a combustible mixture;
means for igniting the combustible mixture; and
a burner for directing the ignited combustible mixture into the enclosure in a downward and radially inward direction that intersects the central axis, the burner having an elongated passage outwardly disposed from the side wall of the furnace, the passage having an inlet coupled to the mixing means, an outlet opening into the enclosure at the side wall, and a longitudinal axis extending downwardly from the inlet through the outlet to intersect the central axis of the furnace in the hearth.

3,899,629
PRESHAPED WIRE ROD AND SPACER HAVING INCREASED LEVERAGE AND GRIPPING FORCE

Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed May 22, 1974, Ser. No. 472,138
Int. Cl.[2] H02G *7/12*
U.S. Cl. 174—40 R 4 Claims



1. A device for spacing parallel conductors when applied thereto comprising a wire or rod-like element having two, parallel portions preshaped with helices to conform to said conductors when applied thereto, and a spacer portion located intermediate said portions for extending between the conductors, the helices of the parallel portions having pitches between adjacent helices that increase in the direction away from the spacer portion, and a constant internal diameter corresponding to the external diameter of the conductors to tightly grip the same when applied thereto, the increase in pitch between adjacent helices providing an elongated element portion that is effective to minimize the force required to respectively apply the parallel portions to the conductors, the smallest pitch helix having a maximum gripping force, with a minimum use of element material.

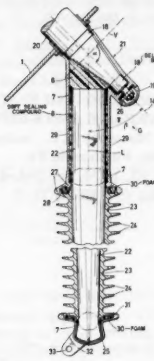
3,899,630
HIGH VOLTAGE INSULATOR ASSEMBLY FITTED WITH PIVOTAL MOUNTING MEANS FOR SAID INSULATOR

Alfred Puck, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,164
Claims priority, application Switzerland, Feb. 6, 1973, 1646/73
Int. Cl. H01b *17/16*
U.S. Cl. 174—43 16 Claims

1. A high voltage insulator assembly comprising an insulator having an elongated core made of glass fibre reinforced plastic material, a pivotable mounting adapted for connecting the insulator to a mast with the pivot axis at the mounting inclined at an angle of from 45° to 90° to the vertical, a skirted insulator covering encasing a first end portion of the core, means coupling said mounting to the non-encased second end portion of said core so that the pivot axis and the longitudinal axis of said core are coplanar and the longitudinal axis is inclined downwardly at an angle of from 30° to 60° to the horizontal,

the coupling means including two spaced apart clamping elements which grip said second end portion of said core at



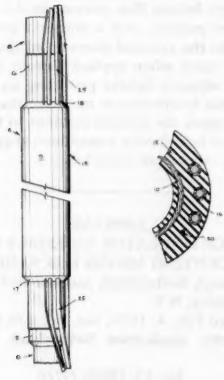
two spaced apart zones, and means connecting said coupling means to said insulator covering.

3,899,631

INFLATABLE SEALING ELEMENT HAVING ELECTRICAL CONDUCTORS EXTENDING THERETHROUGH

Billy E. Clark, Houston, Tex., assignor to Lynes, Inc., Houston, Tex.

Filed Apr. 11, 1974, Ser. No. 459,889
Int. Cl.[2] E21B *33/127*; **F16J** *15/46*
U.S. Cl. 174—47 **3 Claims**



1. An inflatable device for positioning in a well string in a well bore comprising:

a. spaced annular members having threads for securing the annular members in a well string;

b. an annular reinforcing sheath extending continuously longitudinally and circumferentially between and secured to said spaced annular members for receiving an inflating fluid from the well string;

c. an elastomer cover surrounding said sheath and extending between said spaced annular member said elastomer cover expansible by said reinforcing sheath and the inflating fluid therein; and

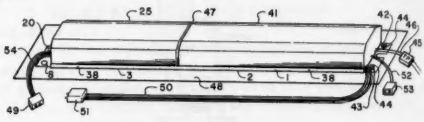
d. at least one electrical conductor embedded in said expansible elastomer cover and extending from each end thereof.

3,899,632

RETROFIT EMERGENCY LIGHTING PACKAGE

Robert P. Alley, Danville, Ill., assignor to Construction Materials Division General Electric Company, Indianapolis, Ind.

Filed Oct. 23, 1973, Ser. No. 408,661
Int. Cl.[2] H05K *5/04*
U.S. Cl. 174—52 R **10 Claims**



1. Apparatus for mounting an emergency lighting system for starting and operating at least one gaseous discharge lamp comprising:

a first elongated mounting member adapted to be mounted to a lighting fixture;

a first enclosure to house at least an emergency lighting driving device, said first enclosure being mounted on a first portion of said first elongated mounting member;

a second enclosure to house at least a battery for providing emergency power;

a second elongated mounting member;

means mounting said second enclosure on said second elongated mounting member;

means selectively mounting said second elongated mounting member on a second portion of said first elongated mounting member;

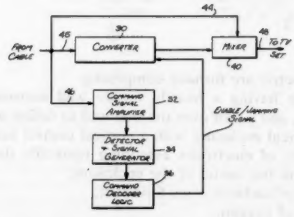
means maintaining said first enclosure a predetermined distance from said second enclosure for providing thermal insulation, said means maintaining including a pair of tabs connected to one end of said second enclosure, a raised portion on one end of said first portion and a slot associated with said raised portion receiving said pair of tabs.

3,899,633

SUBSCRIPTION TELEVISION SYSTEM

Keith S. Sorenson, Diamond Bar, and David E. Lewis, Orange, both of Calif., assignors to Columbia Pictures Industries, Inc., New York, N.Y.

Filed May 12, 1972, Ser. No. 252,670
Int. Cl. H04n *1/44*
U.S. Cl. 178—5.1 **10 Claims**



1. In a controlled transmission system including a central sending station for sending information on at least two secure channels, a plurality of receiving stations, a transmission path coupling the central sending station with said plurality of receiving stations and wherein receivers at said stations are not capable of directly receiving the secure channels sent, each of said receivers having associated therewith a tuner

converter coupled to the central sending station for converting the secured channels sent to a channel receivable by the receiver each tuner converter including a turret tuner switch having a set of contacts to select one or the other of the secured channels for conversion, means for selectively disabling and enabling each of said receivers to receive one or the other of said secure channel signals comprising:

a. means associated with the central sending station for sending in addition to the secure channel signals coded address signals and command signals;

b. means at each receiving station for decoding address and command signals, each decoding means being responsive to a different address code from said central sending station and responsive to at least two separate command signal codes from said sending station;

c. means at said receiving station for providing an interfering signal to said tuner converter;

d. first storage means adapted to be set in response to the reception and decoding of a coded signal addressed to its receiving station and a first command signal;

e. second storage means adapted to be set in response to the reception and decoding of a coded signal addressed to its receiving station and a second command signal; f. an additional set of contacts in said turret tuner having a wiper ganged to the tuner, said wiper coupled to a deactuating input of said interferring means, the additional contact corresponding to the one secured channel being coupled to the output of said first storage means and the additional contact corresponding to said other secured channel being coupled to the output of said second storage means whereby if one of said secured channels is selected that channel can be received only if an appropriate code address and command signal has been received by the receiver causing the associated storage means to be set to disable the interferring means in that receiver when tuned to that secured channel.

3,899,634

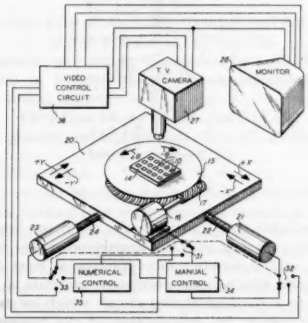
VIDEO CONTROLLED POSITIONING METHOD AND APPARATUS

Liber J. Montone, and Leonard J. Pietruszynski, both of Reading, Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Continuation of Ser. No. 147,051, May 26, 1971, abandoned. This application July 11, 1973, Ser. No. 378,307

Int. Cl. H04m *7/18*

U.S. Cl. 178—6.8 **29 Claims**



20. Apparatus for positioning an article comprising:

means for generating first video signals representing an image of the article;

means for generating second video signals representing an image of a first two-dimensional position marker;

means for generating third video signals representing an image of a second two-dimensional position marker;

means for sensing a coincidence of the first and second video signals and of the first and third video signals; and means for moving the article in response to the sensed coincidence.

3,899,635

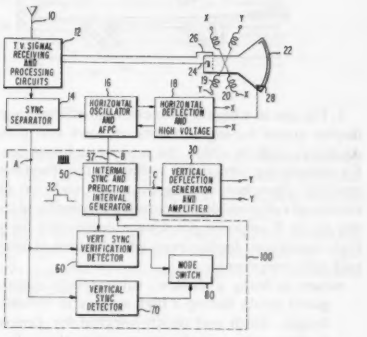
DUAL MODE DEFLECTION SYNCHRONIZING SYSTEM

Steven Alan Steckler, Clark, and Allen Leroy Limberg, Lambertville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 30, 1974, Ser. No. 438,047

Int. Cl.[2] H04N *5/04*

U.S. Cl. 178—69.5 TV **6 Claims**


T.V. SIGNAL RECEIVING AND PROCESSING CIRCUITS
SYNC SEPARATOR
HORIZONTAL OSCILLATOR AND AFPC
HORIZONTAL DEFLECTION AND HIGH VOLTAGE
INTERNAL SYNC AND PREDICTION INTERVAL GENERATOR
VERTICAL DEFLECTION GENERATOR AND AMPLIFIER
VERT. SYNC VERIFICATION DETECTOR
MODE SWITCH
VERTICAL SYNC DETECTOR

1. A synchronizing system comprising:

a source of external synchronizing signals;

resettable counting means adapted for counting signals from a source of second signals integrally related in frequency to said external signals for generating internal signals at said external synchronizing signal frequency, said resettable counting means capable of being reset by said internal signals;

external synchronizing signal verification means coupled to said source of external synchronizing signals and to said resettable counting means for verifying the presence and absence of said external synchronizing signals during said internal signals and for generating first and second signal levels respectively in response thereto;

external synchronizing signal detecting means coupled to said source of external synchronizing signals for detecting when signals from said source have at least a predetermined time duration and for generating signals when said time duration is greater than the minimum time duration of said external synchronization signals; and

mode switching means coupled to said resettable counting means, to said external synchronizing signal detecting means and to said external synchronizing signal verification means for switching to a non-synchronous mode of operation in response to said second signal level generated by said external synchronizing signal verification means for passing a signal from said external synchronizing signal detecting means upon the occurrence of a subsequent signal from said source of external synchronizing signals for resetting said resettable counting means for synchronizing said internal signals such that succeeding internal signals are substantially in synchronism with said subsequent signal from said source of external synchronizing signals.

3,899,636

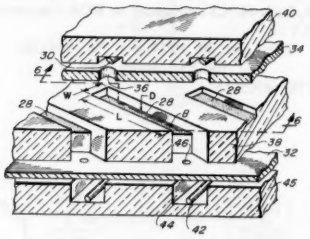
HIGH BRIGHTNESS GAS DISCHARGE DISPLAY DEVICE

Gerald J. Chodil, Harwood Heights, and Michael C. De Jule, Chicago, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 396,273, Sept. 7, 1973, abandoned. This application Jan. 24, 1974, Ser. No. 436,294

Int. Cl.[2] H04N *5/66;* **H01J** *61/16, 61/30*

U.S. Cl. 178—7.3 D **1 Claim**



1. For use in a high brightness, high efficiency gas discharge display panel having a matrix of rows and columns of gas discharge cells in which the positive columns are established for generating ultraviolet radiation for illuminating a light-emissive phosphor coating on a cell wall, an improved gas discharge cell capable of operating efficiently at current densities up to 5 amperes per square centimeter for generating a high brightness display even when pulsed at television rates, said cell comprising:

means defining a shallow, substantially rectangular, elongated cavity having a high surface to volume ratio and a length, width and depth selected for generating a long positive column and a short path to the walls of the cavity for photons generated in the positive column, the length of said cavity being from 30 to 70 mils, the width of said cavity being from 10 to 15 mils, and the depth of said cavity being from 2 to 5 mils;

a cavity wall extending lengthwise of the cavity, having a coating of a light emitting phosphor thereon, and oriented such that the phosphor coating is exposed to the viewed side of the cell;

a gas filling said cavity and comprising helium at a pressure of approximately 100 torr and mercury vapor at a pressure of approximately 0.1 torr; and

anode means and cathode means situated near opposite ends of said cavity between which cell current flows when a positive column is established within the cavity, the combination of said gas, gas pressure and cavity geometry together operating to increase the energy of free electrons within the positive column and to thereby increase cell efficiency and brightness.

3,899,637

FREQUENCY SHIFT KEYED COMMUNICATIONS DEVICE

Frank G. Willard, Pitcairn, Pa., and Earl T. Farley, Altamonte Springs, Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 8, 1974, Ser. No. 440,935

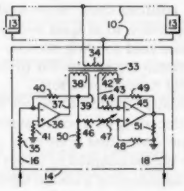
Int. Cl.[2] H04L *5/14*

U.S. Cl. 178—59 **19 Claims**

7. Full duplex frequency shift keyed communications apparatus for communication of digital data over a two-conductor transmission line having characteristic impedance terminations, which line may carry a signal to be received by such apparatus, comprising:

a transmitter to generate a transmit tone comprising one cycle of a repetitive signal in response to a transmision datum bit, and to control the frequency of the generated tone at one of two predetermined values in accordance with the transmission datum bit value, said transmitter to generate a third constant signal when a transmission datum bit is absent;

a transmit/receive separator to generate a voltage signal across the transmission line conductors having a constant proportionality with the transmit tone, so that the composite signal across the conductors is the sum of the generated voltage signal with a signal which may be carried to the apparatus by the transmission line, and to



separate a received tone by subtracting the transmit tone from the composite signal, the received tone comprising one cycle of a repetitive signal having a first or second predetermined frequency in accordance with the bit value of a received datum; and

a receiver responsive to each received tone separated by the transmit/receive separator to detect the frequency of the received tone and to generate a signal in accordance with the datum bit value corresponding to the detected frequency of the received tone.

3,899,638

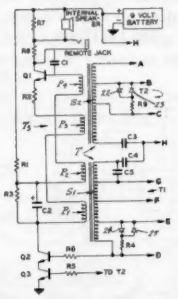
PORTABLE TONE DATA TRANSMITTER

James H. Hahn, St. Louis, Mo., assignor to Interface Technology, Inc., St. Louis, Mo.

Filed Oct. 29, 1973, Ser. No. 410,546

Int. Cl. H04m *11/06, 1/50*

U.S. Cl. 179—2 DP **11 Claims**



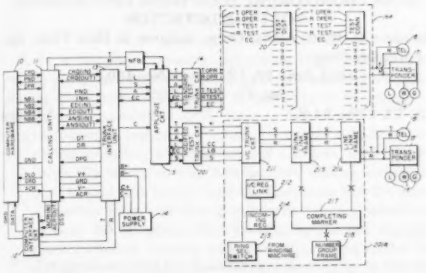
1. In a portable data transmitter for use in sending a signal representative of data over a transmission means such as a telephone, said transmitter incorporating at least a pair of tuned circuits which upon oscillation generate a summed oscillation in a third oscillating circuit which establishes an alternating current for energization of the transmitter for sending of the signal over the transmission means, entry means and a power source in the portable transmitter, the actuation of said entry means energizing said circuits from the power source for establishment of the frequency of oscillations in said tuned circuits, a starter circuit electrically coupled to said third oscillating circuit and being connected to the power source for energization of said third oscillating circuit and

inducement of the summed oscillations therein upon an actuation of the entry means, said starter circuit including a switch means which is energized for operation by means of the tuned circuits immediately upon activation of the entry means for effecting energization of said oscillating circuit from the power source and for establishing its summed oscillating frequency therein for inducement of the alternating current that establishes the signal representative of data for transfer over the transmission means.

3,899,639
SYSTEM AND METHOD FOR READING REMOTELY LOCATED METERS

John B. Cleveley, and Kenneth C. Laubman, both of Edmonton, Canada, assignors to The City of Edmonton, Edmonton, Canada

Filed May 11, 1973, Ser. No. 359,245
Int. Cl. H04q 9/00
U.S. Cl. 179—2 A **21 Claims**



10. In a transducer reading system wherein a telephone number calling unit is programmed by a computer to dial data calls to selected telephone numbers by operating telephone line switching circuitry to connect a selected set of telephone lines through a telephone trunk circuit to the computer and a transducer reading transponder associated with said selected set of telephone lines transmits transducer reading data over said set of telephone lines to said computer, the improvement in combination therewith of means for aborting a data call and resetting said transducer reading system whenever a switch in said telephone line switching circuitry encountered is busy or said set of telephone lines called is busy.

3,899,640
DEVICE FOR BLOCKING TOLL CALLS FROM SUBSCRIBER TELEPHONES

Luigi Piacente, and Sanzio Capannini, both of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Dec. 18, 1972, Ser. No. 315,892
Claims priority, application Italy, Dec. 17, 1971, 32584/71
Int. Cl. H04m 1/66
U.S. Cl. 179—18 DA **10 Claims**

1. A device for blocking the initiation of certain outgoing calls, characterized by a predetermined numerical value of a specified call-number digit, from a subscriber station of a telecommunication system connected via an outgoing line to a central office, comprising:

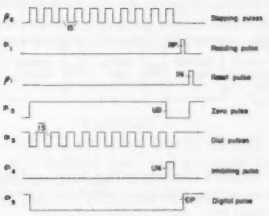
monitoring circuitry at said station connected across said line for detecting dial pulses generated at said station by a call selector periodically opening and closing a line loop;

pulse-shaping means in said circuitry for generating trains of stepping pulses in the rhythm of said dial pulses;

integrating means connected to said pulse-shaping means for deriving an individual digital pulse from any train of stepping pulses;

an electronic pulse counter connected to said circuitry for receiving said stepping pulses therefrom, said counter having at least one output lead electrically marked in response to a predetermined number of consecutive stepping pulses;

control means connected to said integrating means and responsive to a predetermined digital pulse in a sequence of such digital pulses for passing a concurrently generated train of said stepping pulses to said counter;



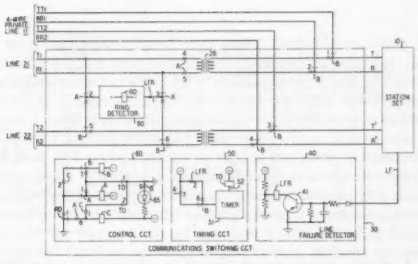
electronic switch means connected to said output lead for shunting said call selector, thereby preventing effective open-circuiting of said line loop and attenuating the dial pulses transmitted to said central office; and

detector means connected to said pulse-shaping means for operating said switch means independently of said counter in response to spurious dial pulses of less than a predetermined duration.

3,899,641
FOUR-WIRE BACKUP FACILITY USING DDD LINES

Richard Henry Etra, Highland Park, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 4, 1974, Ser. No. 447,476
Int. Cl.[2] H04Q 1/24
U.S. Cl. 179—18 EA **11 Claims**



1. Backup facilities for a station normally connected to a four-wire transmission line, said backup facilities using a pair of two-wire transmission lines and comprising, switching means operable for disconnecting said station from said four-wire line and connecting said station to said pair of two-wire lines, and means operative only upon failure of said four-wire line for operating said switching means automatically in response to a predetermined sequence of signals on said pair of two-wire lines.

3,899,642

METHOD OF DISTRIBUTING TONE AND ALERTING SIGNALS IN A TDM COMMUNICATION SYSTEM

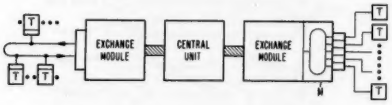
Ivor Jones, Winchester, England; Hans Rudolf Muller; Daniel Wild, and Pitro Alois Zafiropulo, all of Adliswil, Switzerland, assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Mar. 29, 1973, Ser. No. 345,938

Claims priority, application Switzerland, Mar. 30, 1972, 4775/72

Int. Cl. H04m *3/00*

U.S. Cl. 179—18 J **9 Claims**



1. The method of distributing tone and alerting signals to terminals in a time division multiplex communication system, characterized by

concurrently transmitting binary sample bits of the cadencing signals for all tone and alerting signals over a common time-division multiplex channel accessible by all terminals, all sample bits corresponding to one sampling time being combined in one cadence control word;

and generating in a terminal the signal temporarily required for it, after receiving a corresponding command, by evaluating the received cadence control words and influencing a separate basic signal with a regenerated cadencing signal.

3,899,643

TELEPHONE SUBSET CIRCUIT

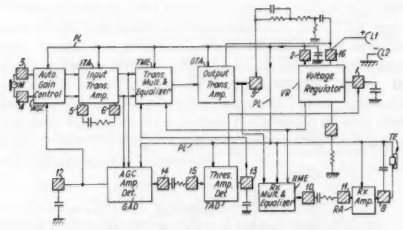
Camilo Manansala Tabalba, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed July 30, 1973, Ser. No. 383,735

Claims priority, application United Kingdom, Aug. 22, 1972, 39083/72

Int. Cl. H04m *1/60*

U.S. Cl. 179—81 B **18 Claims**



1. An electronic circuit for use in a telephone subscriber's instrument having a microphone and a receiving transducer comprising:

first amplification means for coupling said microphone to a two-wire telephone line coupled to a telephone exchange and to provide a side tone;

automatic gain control means coupled to said microphone and said first amplification means;

second amplification means for coupling said line to said receiving transducer;

voltage regulator means coupled to said line and said first and second amplification means, said voltage regulator means being responsive to line conditions of said line to adjust the gain of both of said first and second amplification means according to said line conditions;

a first conductor coupled between said first amplification means and said second amplification means to provide said side tone for said receiving transducer to enable a subscriber to hear in said receiving transducer what is leaving said instrument;

a second conductor to couple an output of said first amplification means to one wire of said line; and

a resistor-capacitor filter network coupled between one wire of said line and the input of said second amplification means, said filter network conducting therethrough an equal value of output signal from said first amplification means in phase opposition thereby leaving only said side tone and an input signal from said telephone line to be coupled to said second amplification means.

3,899,644

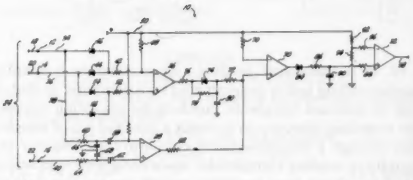
AC/DC-MONITORING TELEPHONE LINE RINGING VOLTAGE DETECTOR

Theodore R. Hunt, Aloha, Oreg., assignor to Data Time, Inc., Portland, Oreg.

Filed June 19, 1974, Ser. No. 480,613

Int. Cl. H04q *9/00*

U.S. Cl. 179—84 R **3 Claims**



3. Apparatus for detecting at the location of a subscriber's telephone set the presence of AC ringing voltage in a telephone line connected to the set, where the line includes conductors that will present such voltage with placement of a call to the set, as well as conductors wherein DC voltage of two different levels may exist at different times depending upon the on-hook or off-hook condition of the set, such DC voltage being larger than a certain voltage with the set in an on-hook condition, and less than said certain voltage with the set in an off-hook condition, said apparatus comprising

input means adapted for connection to the conductors in a telephone line,

a DC voltage monitor operatively connected to said input means for producing an indication of a certain type with the level of DC voltage in those telephone line conductors wherein the magnitude of DC voltage is indicative of the on-hook/off-hook condition of a connected telephone set above said certain voltage,

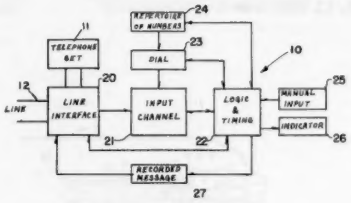
an AC voltage monitor operatively connected to said input means for producing an indication when AC exists in the telephone line, and

a simultaneity circuit operatively connected to said DC and AC voltage monitors for indicating the simultaneous occurrence of an indication of said certain type from the former, and of an indication by the latter that AC exists in the telephone line.

3,899,645
PROCESSOR FOR CONTROLLING THE OPERATION OF A TELEPHONE

Hanoch Brafman, Tel Aviv, Israel, assignor to Yeda Research and Development Company Incorporated, Tel Aviv, Israel

Filed Dec. 11, 1972, Ser. No. 314,019
Claims priority, application Israel, Dec. 16, 1971, 38379
Int. Cl.[2] H04M 3/42
U.S. Cl. 179—90 AD 11 Claims



5. In a telephone system, apparatus disposed between a calling party instrument and a telephone line for successively placing calls from a repertoire of numbers to be called, said apparatus comprising:

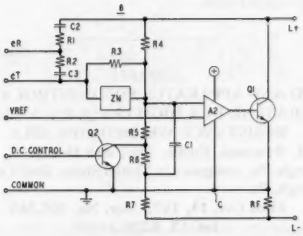
active storage means for storing a list of numbers to be dialed including first and second sections, said list being originally stored in said first section, dialing means coupled to said first section and the telephone line for dialing a number from said list of numbers, sensing means coupled to the telephone line for sensing the line signals at predetermined sensing intervals after completion of a dialing cycle, and for generating a first signal in the presence of a busy tone, a second signal in the presence of a ring back tone, a third signal in the presence of a ring back tone that persists for a predetermined period of time, and a fourth signal in the absence of line signals for a predetermined period of time; and

audio means for providing an audio input to the line between said predetermined sensing intervals.

3,899,646
TELEPHONE SET SPEECH NETWORK

Douglas Romain Cobb, Dunwoody, Ga.; Roger Edward Holtz, Indianapolis, Ind., and David Carlaw Trimble, Holmdel, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 28, 1974, Ser. No. 473,792
Int. Cl.[2] H04B 1/52
U.S. Cl. 179—170 NC 18 Claims



1. A speech network for a telephone set comprising first and second telephone line terminals, a common terminal, a reference terminal, a third transmit terminal and a fourth receive terminal, CHARACTERIZED IN THAT said network includes:

a current source connected between said first line terminal and said common terminal, said current source having first and second control inputs with said second control input connected to said reference terminal;

a first impedance network connected between said first line terminal and said first control input;

a second impedance network connected between said third terminal and said first control input;

a third impedance network connected between said second line terminal and said first control input;

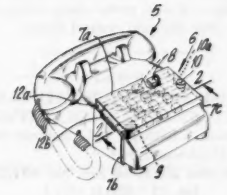
a first impedance element connected between said common terminal and said second line terminal; and

means for combining signals appearing at said third transmit terminal with signals appearing at said first line terminal for producing a signal at said fourth receive terminal.

3,899,647
BUTTON TELEPHONE LOCK GUARD

Zolman Nachsi, 613 Bedford Ave., and Abraham Zorger, 226 Broadway, both of Brooklyn, N.Y.

Filed July 20, 1973, Ser. No. 381,076
Int. Cl.[2] H04M 1/66
U.S. Cl. 179—189 D 6 Claims



1. A button-telephone lock-guard device comprising in combination: at least first and second structure means, one including a first portion of a locking means and the other including a second portion of a locking means, the first and second locking portions comprising in combination a locking means for locking releasably one to the other, at least one of the first and second structure means including at least one downwardly extending partition element of a predetermined size and shape received between adjacent buttons of a push-button telephone when the locking means is in a locked state, each of the first and second structure means including securing means fastened securely to and at least partially circumscribingly of a button-containing portion of the push-button telephone when the locking means is in a locked state such that when each of the first and second structure means are fastened to the push-button telephone having push buttons, and the locking means in a locked state, the at least one downwardly extending partition element extending longitudinally along with of the first and second structure means, providing thereby against lateral shifting of the first and second structure means and also providing thereby a deterrent against access to the buttons, each partition element being an elongated thin flange extending downwardly from an upper portion of at least one of the first and second structure means at substantially a right angle thereto.

3,899,648

NODALLY OPERATED PUSH-BUTTON SWITCH

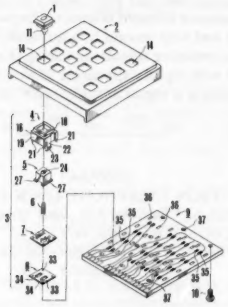
Taneo Murata, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1974, Ser. No. 450,865

Claims priority, application Japan, Mar. 16, 1973, 48-30685

Int. Cl. H01h 5/30, 13/64

U.S. Cl. 200—5 R 4 Claims



1. A nodally operable push-button switch comprising a case, and a flexible conducting metal plate, said plate having a normally curved central stripe and a pair of rectangular holes at both sides of said central stripe integrally formed therewith and also having a pair of resilient contact pieces integrally extended therefrom smaller than the size of the holes, and opposite side edges of said metal plate being drawn so that they are shorter than the said central stripe.

3,899,649

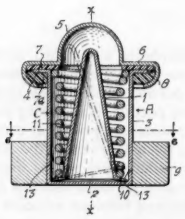
INERTIAL IMPACT SWITCH WITH NORMALLY CENTERED, CONDUCTIVE OSCILLATING CONTACT

Bernard M. Jenkins, Chatham, N.J., assignor to C. B. Kaupp & Sons, Inc., Maplewood, N.J.

Filed June 20, 1974, Ser. No. 481,212

Int. Cl.[2] H01H 35/14

U.S. Cl. 200—61.51 4 Claims



1. An inertial impact switch comprising a housing which includes first and second coaxial conductive sections electrically insulated from each other, the first of which serves as a switch contact element, a coaxial movable contact element normally in conductive engagement with the second housing section, said movable contact element being normally urged by a spring into contact with the second housing section and into spaced relation to the first housing section and adapted to be urged to momentarily contact with the first housing section in response to an impact received by the switch, said spring having one end directly engaging said movable contact element and its other end abutting an insulation disc between said housing sections, said first housing section having an exterior circular mounting terminal and said second housing section having an exterior polysided mounting terminal coaxial with said circular mounting terminal.

3,899,650

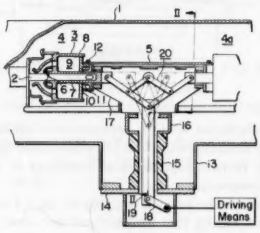
GROUNDED TANK CIRCUIT BREAKER

Tuneo Kishi, and Seizo Nakano, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 17, 1973, Ser. No. 389,266

Int. Cl. H01h 33/88

U.S. Cl. 200—148 A 6 Claims



1. A circuit breaker of a grounded tank type comprising:

a. a grounded tank containing an arc-extinguishing gas;

b. first and second breaking sections disposed in the grounded tank, each of said breaking sections including a stationary contact,

a movable contact opposed to the stationary contact,

a movable cylinder integral with the movable contact,

and a fixed piston cooperating with the moveable cylinder to produce a pressurized arc-extinguishing gas;

c. a link device interposed between said first and second breaking sections for transmitting driving force from a driving source to the respective movable cylinders of said first and second breaking sections;

d. supporting means which supports said first and second breaking sections in the grounded tank through the respective fixed piston; and

e. conductive means electrically connecting said first and second breaking sections in series and substantially enclosing said link device for shielding said link device from the grounded tank.

3,899,651

METHOD AND APPARATUS FOR CONTROL OF WELD TEMPERATURE IN A HIGH FREQUENCY ELECTRIC RESISTANCE WELDED PIPE MILL

Howard J. Bowman, Eustis, Fla., and Donald G. Schindler, Pittsburgh, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

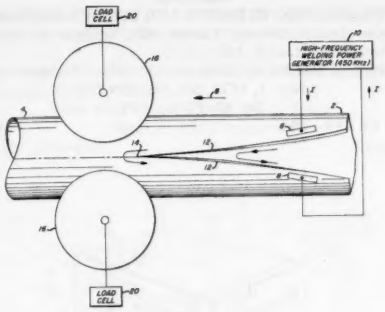
Filed Oct. 11, 1973, Ser. No. 405,369

Int. Cl. B23k 31/06

U.S. Cl. 219—67 15 Claims

1. A method of controlling the welding temperature in a high frequency electric resistance welded pipe mill comprising the steps of

selecting a control factor, for which an actual value will be compared to a desired value for control purposes, from the equation



$$\Delta T = \frac{K_R I^2}{WS}$$

where ΔT is the temperature rise of the material being welded, K_R is a constant, I is the weld power current, W is the wall thickness of the pipe and S is the mill speed,

continuously measuring mill control parameters I and S,

continuously providing a signal representative of wall thickness,

continuously calculating one value of said factor using said equation with the measured value of I, the wall thickness signal and a value for the remaining factor in the equation,

continuously providing a difference signal by comparing said one valve of said control factor with the other value of said factor

selecting one of said mill control parameters, and

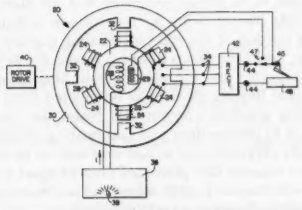
continuously varying said mill control parameter in accordance with said difference signal.

3,899,652

EXTENDED RANGE INDUCTOR ALTERNATOR ARC WELDER

Stanley M. Terry, deceased, late of Dayton, Maine, and by the Third National Bank of Hampden County, executor, Springfield, Mass., assignors to Maremont Corporation, Saco, Maine

Filed Dec. 26, 1973, Ser. No. 427,818
Int. Cl. H02k *17/42*
U.S. Cl. 219—133 **5 Claims**



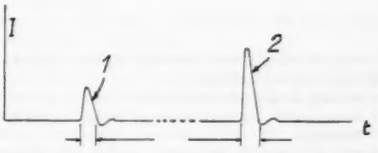
1. An arc welder comprising an inductor alternator having a stator core with a plurality of poles, a first field winding fixed relative to said stator core and having when excited a magnetic field passing through said stator poles, a plurality of generating windings fixed relative to said stator core and received on said poles thereof, and a windingless rotor rotatable relative to said stator core to cyclically vary the reluctance of flux paths through said stator poles to vary the flux passing through said poles and to thereby induce alternating voltages in said generating windings, a variable electrical supply connected to excite said first field winding, two output terminals, means connected between said generating windings and said two output terminals to supply said two output terminals with electrical power derived from the voltages induced in said generating windings, a welding electrode, means for connecting one of said two output terminals to said electrode, means for connecting the other of said two output terminals to a workpiece, a second field winding included in said inductor alternator and fixed relative to said stator core and having when excited a magnetic field which also passes through said stator poles, and means for selectively connecting and disconnecting said second field winding to and from exciting series relationship with the output current from said two output terminals.

3,899,653

ELECTRICAL RESISTANCE WELD METHOD AND APPARATUS

Gaetano Emanuele Spinnato, Genova, Italy, assignor to Oraltechnic Anstalt, Liechtenstein, Italy

Division of Ser. No. 342,524, March 19, 1973, abandoned. This application Apr. 24, 1974, Ser. No. 463,766
Claims priority, application Italy, Mar. 22, 1972, 12549/72; Mar. 22, 1972, 12550/72
Int. Cl.² B23K *11/24, 9/28*
U.S. Cl. 219—113 **6 Claims**



1. An apparatus for welding together metallic parts comprising:

a. first and second variable transformers,

b. a rectifier,

c. a condenser,

d. a pulse transformer,

e. first switch means for cyclically and alternately connecting said first and second variable transformers to said rectifier;

f. second switch means for selectively connecting said rectifier to said condenser;

g. third switch means for selectively connecting said condenser to said pulse transformer;

h. programmer means, which controls said switch means at each welding cycle, for, in sequence, during each cycle, connecting said first variable transformer to said rectifier, and said rectifier to said condenser, and disconnecting said condenser from said pulse transformer for a time sufficient to charge said condenser to a first weld charge; disconnecting said rectifier from said condenser and connecting said condenser to the said pulse transformer for a time sufficient to discharge said condenser and connecting said second variable transformer to said rectifier, connecting said rectifier to said condenser, and disconnecting said condenser from said pulse transformer for a time sufficient to charge said condenser to a second weld charge and then disconnecting said rectifier from said condenser and connecting said condenser to said pulse transformer, for a time sufficient to discharge said condenser;

i. and a welding tool connected to the output of said pulse transformer.

3,899,654

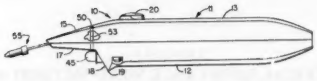
SOLDERING IRON TIP ASSEMBLY AND CORDLESS SOLDERING IRON EMBODYING SAME

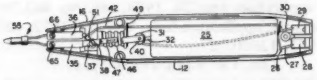
William M. Walton, Sterling, Ill., assignor to Wahl Clipper Corporation, Sterling, Ill.

Continuation of Ser. No. 214,303, Dec. 30, 1971, abandoned. This application Sept. 26, 1973, Ser. No. 401,060

Int. Cl. H05b 3/02; B23k 3/04

U.S. Cl. 219—229 8 Claims





1. An electrically and thermally highly efficient cordless soldering iron, comprising:

a housing having a forward end;

a rechargeable battery means of limited capacity in said housing;

a pair of terminals electrically insulated from each other mounted at the forward end of said housing and connected to said battery means;

a switch in said housing in circuit with said battery means and said terminals;

a hollow heatable tip member adapted to be supported in spaced relation with the forward end of said housing;

a heating element of resistance wire within said tip member in effective heating relation therewith and electrically insulated therefrom, said element having predetermined power consumption in operation; and

a pair of electrical conductors of deformable solid wire connected between said heating element and said terminals for energizing said element and for solely supporting said element and said tip member in spaced relation to the forward end of said housing, the combined operating resistance of said conductors being less than 10% of the operating resistance of said element and the heat conductance of said conductors being less than ½ that of copper conductors of the same cross sectional area;

said predetermined power consumption of said element in operation (watts) and the transverse cross sectional area of said electrical conductors (square inches) being such that the quotient thereof is more than 4000 watts per square inch;

said rechargeable battery means having current and voltage ratings sufficient to satisfy said power consumption requirement;

whereby said deformable solid electrical conductors provide requisite support and electrical conductivity with a sufficiently small cross-sectional area to prevent significant heat transfer to said terminals and said housing and to prevent significant heat loss by radiation and conduction from said electrical conductors, rendering said soldering iron electrically and thermally highly efficient.

3,899,655

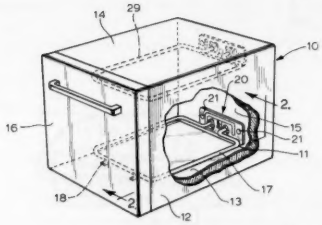
OVEN, HEATING ELEMENT AND SOCKET ASSEMBLY

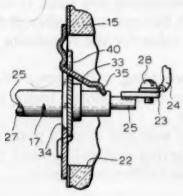
Charles Arthur Skinner, Laurel, Md., assignor to Electro-Therm, Inc., Laurel, Md.

Division of Ser. No. 431,848, Jan. 9, 1974. This application Nov. 1, 1974, Ser. No. 519,905

Int. Cl. F27d 11/02

U.S. Cl. 219—404 1 Claim





1. In an oven, the combination of:

an oven housing having a side wall and defining an aperture in said side wall;

a rod-type heating element in said oven housing; and

a socket assembly over said aperture of said housing for suspending said rod-type heating element, said socket assembly comprising:

a base plate dimensioned so as to be able to overlie the aperture of the oven and including means adapting the base plate to be affixed overlying that aperture;

a hinge plate having means for receiving in locking engagement a portion of the rod-type heating element; and

said hinge and base plates defining means for holding said plates together and for allowing said hinge plate and its captivated heating element to be pivoted from a normal operating position wherein said plates are parallel and adjacent to one another and said heating element is substantially perpendicular to said side wall, to an alternative position wherein said plates are pivoted apart to be on an angle with respect to each other, and said heating element is angularly disposed to said side wall;

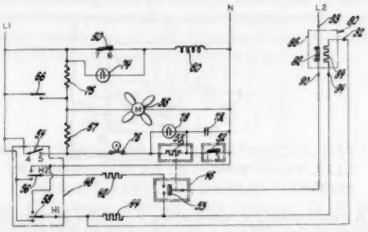
said means for holding said plates together including ear-receiving means formed longitudinally on one of said plates and longitudinally extending ear formed on the other of said plates; and

said means for holding said plates together further including a tab formed unitarily with and depending from one of said plates for bearing against a cutout portion of the other of said plates to urge said ear into engagement with said ear-receiving means.

3,899,656
SELF-CLEANING OVEN WITH TEMPERATURE LIMITING PROTECTION SYSTEM FOR BAKE AND CLEAN

Roy R. Smith, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 13, 1974, Ser. No. 532,622
Int. Cl.[2] F27D *11/02*
U.S. Cl. 219—413 5 Claims



1. In an oven comprising an oven liner and an access door forming an oven cooking cavity, heating means for cooking food placed within the cavity as well as for pyrolytically removing food soil from the inner wall surfaces of the oven cavity, said heating means including a heating element and electrical power supply circuitry settable for energizing said heating element at high voltage when said circuitry is set for a BAKE mode of operation and for energizing said heating element at low voltage when said circuitry is set for a CLEAN mode of operation, oven thermostat means including oven temperature responsive switch means in said circuitry in power supply relationship with said heating means for controlling said heating element below first and second predetermined temperature limits, an oven cabinet surrounding the oven liner, and insulation between said oven liner and said oven cabinet, the invention comprising over-temperature protective means for selectively protecting against temperatures in said oven cavity above either of said first and second predetermined temperature limits, said protective means including an enclosure housing a thermostatic oven temperature limiter switch in heat transfer relation with said enclosure and a supplemental heater in heat transfer relation with said limiter switch, said supplemental heater connected in shunt with said heating element to provide more heat to said limiter switch during a BAKE mode of operation when said heating element is energized at high voltage than during a CLEAN mode of operation when said heating element is energized at low voltage, said enclosure mounted in heat transfer relation with said oven cabinet to sense indirectly temperature changes within said oven cavity, and said limiter switch in said circuitry in power supply relationship with said oven temperature responsive switch means thereby to interrupt power supply to said heating element during a BAKE mode of operation when oven temperature exceeds said first predetermined temperature limit and to interrupt power supply to said heating element during a CLEAN mode of operation when oven temperature exceeds said second predetermined temperature limit.

3,899,657
ELECTRIC HEATING DEVICE FOR INTERNALLY COOKING A MEAT PRODUCT

Jarl Johnson, 18 Crestview Dr., Somers, Conn. 06071

Filed June 20, 1973, Ser. No. 371,720
Int. Cl. H05b *3/48;* A47j *37/00*
U.S. Cl. 219—523 1 Claim

1. In a meat product cooking assembly connectible to an appropriate power source in such as a vehicle or boat and functioning as an impaling member for impaling a meat product during a cooking program,

the combination of:

an elongated electric heating element,

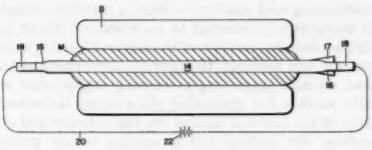
a sheathing of electrical insulating material incapsulating the heating element,

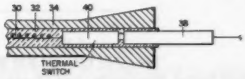
an outer tubular and metallic heat conductive shell circumscribing the sheathing,

a thermal switch located within the outer shell,

a first terminal extending out from a first end of the outer shell with one end of the heating element being connected thereto,

the other end of the heating element being connected to one side of the thermal switch,





a second terminal extending out of the second end of the outer shell with the other side of the thermal switch being connected thereto,

the thermal switch being encapsulated in the sheathing of electrical insulating material,

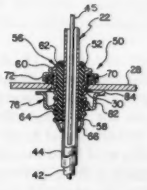
one end of the outer shell being crimped to define a pair of diametrically-opposed flattened winglike appendages for facilitating manipulation of the assembly during operational use,

electrical connections extending from the terminals for connecting the heating element and thermal switch to the power source.

3,899,658
SHEATHED HEATING ELEMENT INSTALLATION

Johnny W. Yartz, Anchorage, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sept. 6, 1973, Ser. No. 394,929
Int. Cl.[2] H05B *3/06*
U.S. Cl. 219—536 4 Claims



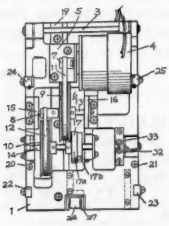
1. In a dishwasher comprising a door and a tub, having first and second apertures therethrough and, an exterior coated metallic section adjacent said apertures, providing together a wash chamber; the improvement being a resistive heating element in the chamber having opposite ends extending through the apertures, each end including a core, an insulator around the core, a metallic sheath around the insulator and terminals exterior of the tub; and means sealing the sheath to the inside of the tub and grounding the sheath to the metallic section, said sealing and grounding means comprising: a first resilient seal in surrounding sealing relationship with each of the ends of said sheath; a rigid metallic sleeve, in surrounding

sealing engagement with each of said first seals, each rigid sleeve extending through one of said apertures and having a first end including a radially outwardly projecting flange and a second threaded end having an element bearing against the sheath in electrical connection therewith, said ends being disposed adjacent the interior and the exterior, respectively, of the tub and said first resilient seals each underlying and extending from said first end to said second end of its respective rigid sleeve; a second seal member including a rigid cup-shaped washer abutting said flange of said first sleeve end; and, a resilient washer disposed between said cup shaped washer and the interior of the tub in sealing engagement therewith, said rigid cup-shaped washer partially enclosing and deforming said resilient washer; a metallic rotatable fastener threadably connected to each second sleeve end and bearing against the exterior of the tub and binding said flange against the seal member, the fastener comprising at least one pointed element projecting in bearing engagement with the metallic section for scratching the coating therefrom upon rotation of the fastener against the tub exterior and effecting grounding; the sealing and grounding means providing a ground path between the sheath and the metallic section through the sleeve element bearing against the sheath, the metallic sleeve and the rotatable fastener.

3,899,659
MAGNETIC CARD READER

Siyunzi Nakai, Moriguchi, and Masazumi Nakarai, Kyoto, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 24, 1973, Ser. No. 391,468
Claims priority, application Japan, Aug. 25, 1972, 47-85497
Int. Cl.[2] G06K *7/08, 13/103;* **B65H** *3/30;* **G11B** *25/04*
U.S. Cl. 235—61.11 D **5 Claims**

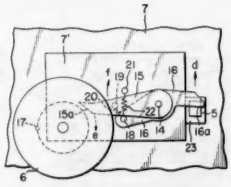


1. A magnetic card reader for reading information from a card containing a magnetic record thereon comprising:
magnetic head means for reading information from said card as said card traverses said head means;
a lower frame carrying said head means;
an upper frame carrying a drive roller means; and
positioning means for placing said drive roller means in alignment with said magnetic head means and causing the direct engagement of said card between said drive roller means and said magnetic head means, said drive roller means including rollers disposed only on the opposite side of the card from said magnetic head means and in alignment with said head means when so positioned by said positioning means; and
support means for said card on said lower frame consisting only of said magnetic head means and guide means for engaging the edges of said card;
whereby the only element which contacts said magnetic record is said magnetic head means, thus minimizing wear of said magnetic record.

3,899,660
MECHANISM FOR MAINTAINING A COUNTER AT ITS RESET POSITION

Yukuo Karube, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1973, Ser. No. 423,773
Claims priority, application Japan, Dec. 25, 1972, 48-23%
Int. Cl.[2] G06C *15/42;* **G06M** *1/28*
U.S. Cl. 235—103 **7 Claims**

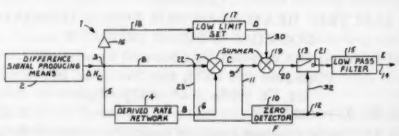


1. A mechanism for maintaining a counter at its reset position until the start of forward rotation of a rotatable member, said counter counting the rotation of the rotatable member and being provided with a resetting member for resetting the counter to its initial position, said mechanism comprising:
a first projection member provided on said rotatable member to project in a nonparallel direction with respect to the plane of the rotation of the rotatable member;
a first lever engageable with an engaging portion of said resetting member, said first lever being pivotably mounted on a basic body;
a second lever pivotably mounted on the basic body, said second lever being adapted to be disposed across a locus of the movement of said first projection member when said resetting member is engaged with said first lever;
a second projection member mounted on said first lever within the range of the movement of said second lever, said second projection being engageable with said second lever when the rotatable member rotates forwardly;
a first urging member for urging said first and second levers to approach each other, said first urging member being disposed between said first and second levers; and
a second urging member disposed between the basic body and said first lever, said second urging member, when said resetting member is engaged with said first lever, effecting the urging action thereof to maintain the engagement between said resetting member and said first lever, and, when said resetting member is not engaged with said first lever, urging said second projection member to displace said second lever out of the locus of the movement of said first projection.

3,899,661
METHOD AND APPARATUS FOR ALTITUDE CAPTURE CONTROL FOR AIRCRAFT GUIDANCE SYSTEMS

James J. Lehfeldt, Olathe, Kans., assignor to King Radio Corporation, Olathe, Kans.

Filed Aug. 27, 1973, Ser. No. 391,854
Int. Cl. G01c *21/00;* **B64c** *13/18*
U.S. Cl. 235—150.2 **9 Claims**



1. A system for computing the initiation of an altitude capture maneuver for an aircraft, said system comprising:

means for providing a first electrical signal representing the altitude differential between a known aircraft altitude and a desired aircraft altitude;

means for deriving a second electrical signal representing the rate of aircraft altitude change;

means for summing said first and said second electrical signals thereby producing a third signal;

means interconnected by said third signal for detecting a zero indication;

means for generating a fly through bias signal in response to said first electrical signal;

means for adding said fly through bias signal to said third signal thereby generating an aircraft maneuver signal; and

means responsive to said detecting means for switching said maneuver signal to an output line.

3,899,662

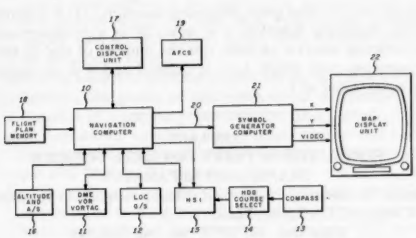
METHOD AND MEANS FOR REDUCING DATA TRANSMISSION RATE IN SYNTHETICALLY GENERATED MOTION DISPLAY SYSTEMS

Richard C. Kreeger, Phoenix, and Matthew O. Kuitunen, Glendale, both of Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 30, 1973, Ser. No. 420,748

Int. Cl. G06f *15/20*

U.S. Cl. 235—151 **15 Claims**



1. A digitally controlled synthetically generated motion display system in which successively displayed frames of information provide an illusion of motion comprising

first digital computer means for providing digital background words representative of information elements that comprise nonsuccessive frames and of the locations of said elements in said frames and for further providing digital incremental words representative of incremental motions of said information elements between successive frames,

second digital computer means responsive to said background and incremental words for combining said incremental words with said background words to provide incremented words defining said successive frames,

transmission means coupled said first digital computer means to said second digital computer means for transmitting said background and incremental words therebetween, and

display means coupled to said second digital computer means for displaying said successive frames in response to said incremented words,

thereby displaying a succession of frames providing an illusion of motion.

3,899,663

MEASURING DIMENSIONS OF SECTIONS

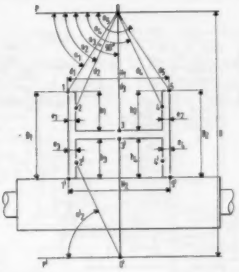
Robert Alfred Pirlet, Embourg, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed June 18, 1973, Ser. No. 370,660

Claims priority, application Belgium, June 20, 1972, 785160

Int. Cl. G06f *15/20*; **G01b** *11/00*

U.S. Cl. 235—151.32 **13 Claims**



1. A method of measuring the dimensions of an elongate section, comprising: selecting two fixed observation points so that the elongate section lies between them; arranging two directional telemeters to measure the distance from the respective observation points to the section along a directional axis which is pivotable about a pivot axis passing through the corresponding observation point and extending along the elongate section, the observation points and directional axes lying in a single plane transverse to the elongate section the intersection of this plane with the elongate section having a periphery which is the sectional contour of the elongate section; scanning the sectional contour by means of the telemeters by pivoting the directional axes about the pivot axes; recording the distance and direction of a plurality of points on the sectional contour with respect to the corresponding observation point; and calculating the dimensions of the elongate section from the said distances and directions.

3,899,664

APPARATUS FOR DETERMINING THE COURSE OF STROKE, SPEED, AND ACCELERATION ON A CAM PROFILE

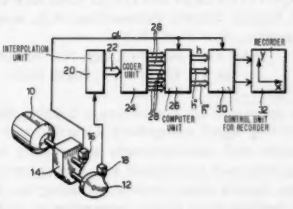
Mario Bencini, and Massimo Fantacchiotti, both of Turin, Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed Feb. 21, 1974, Ser. No. 444,423

Claims priority, application Italy, Feb. 23, 1973, 67471/73

Int. Cl. G06f *15/20*; **G06g** *7/78*

U.S. Cl. 235—151.32 **4 Claims**



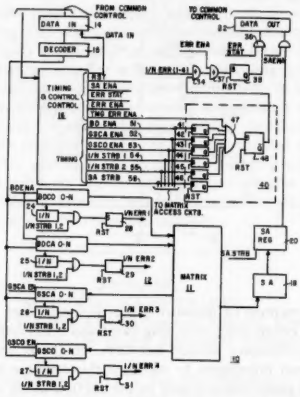
3. An apparatus according to claim 2, wherein said coder means further comprises a circuit for the determination of the sign controlled by the figure of increment of the stroke, the complement of the figure of increment of the stroke, and a

signal furnished by the counter means when its content is zero, for furnishing a signal indicating said sign.

3,899,665
TIMING ERROR DETECTION CIRCUIT

David E. Gaon, Villa Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 18, 1974, Ser. No. 434,744
Int. Cl.[2] G05B 23/02; H03K 5/18
U.S. Cl. 235—153 A 10 Claims



1. In a communication switching system including at least one peripheral unit and a common control means for supplying data and commands to said peripheral unit, said peripheral unit including timing means responsive to a command provided by said common control means to generate a plurality of timing signals for sequencing the operation of said peripheral units, a method for detecting timing errors in said peripheral unit comprising:

registering at least certain ones of said timing signals as said timing signals are generated during a given operation cycle,

wherein registering said certain timing signals includes enabling a different latch circuit to provide a first output as each of said certain timing signals is generated whereby said latch circuits provide a first set of outputs whenever all of said certain timing signals are generated and a different set of outputs whenever one or more of said certain timing signals fails to be generated.

3,899,666
INTEGRAL CORRELATION AND TRANSVERSE EQUALIZATION METHOD AND APPARATUS

Thomas Vincent Bolger, Pennsauken, N.J., assignor to RCA Corporation, New York, N.Y.

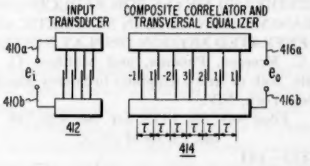
Filed Oct. 24, 1973, Ser. No. 409,066
Int. Cl. G06g 7/19; H03h 9/00
U.S. Cl. 235—181 3 Claims

1. An apparatus for correlating a continuous input phase-coded analog signal comprising a carrier with phase coded modulations and simultaneously suppressing time sidelobes resulting from said correlation to a predetermined level, said apparatus having input means including an input electro-acoustic surface wave device responsive to said input phase-coded analog signal for generating an acoustical surface wave, said input device being arranged as a filter matched to said carrier of said analog signal, said input surface wave device being deposited on a substrate capable of supporting an acoustical surface wave, comprising:

an electro-acoustic surface wave device formed of a set of interdigitated comb-shaped electrodes deposited on said substrate in position relative to said input means to receive an acoustical surface wave therefrom, and to generate in response to said surface wave an electrical signal having a spectral response in accordance with the relative spacing and overlap of said electrodes,

output means coupled to said electrodes to provide an instantaneous output electrical signal from said last-mentioned device in continuous response to said surface wave, said output electrical signal being equal to a compressed form of said input analog signal and having time sidelobes below said predetermined level,

the spacing and overlap of said electrodes being arranged in accordance with a weighting function $f_3(t)$ having the form,



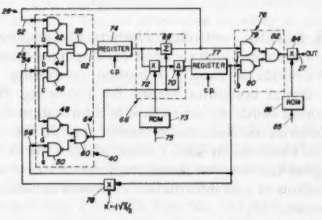
$$f_3(t) = \sum_{k=0}^{k=n-1} f_1(t-K\Delta t) \cdot f_2(k\Delta t)$$

where $f_1(t)$ is a first given weighting function $f_2(t)$ is a second given weighting function, t is time, Δt is a predetermined incremental interval of time, n is the number of said Δt time increments over which $f_2(t)$ is defined and k is an integer between 0 and $n-1$.

3,899,667
SERIAL THREE POINT DISCRETE FOURIER TRANSFORM APPARATUS

Joseph D. Simone, Chelmsford, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 26, 1972, Ser. No. 318,346
Int. Cl. G06f 15/34
U.S. Cl. 235—156 2 Claims



1. Digital data processing apparatus comprising:

commutating means having a plurality of inputs, one thereof being coupled to a source of digital samples;

an arithmetic unit having a pair of outputs, a first one thereof being coupled to one of the plurality of inputs;

a pair of storage means, a first one thereof being coupled between the commutating means and the arithmetic unit and a second one thereof being coupled between a second one of the pair of outputs and one of the plurality of inputs, and, wherein the arithmetic unit includes:

a summing circuit coupled between the first one of the pair of storage means and the first one of the pair of outputs;

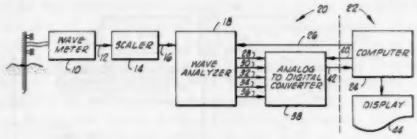
and a differencing circuit coupled between the first one of the pair of storage means and the second one of the pair of storage means.

3,899,668

ELECTRONIC WAVE ANALYSIS

Robert B. Tucker, Jr., New Orleans, La., assignor to Continental Oil Company, Ponca City, Okla.

Filed Mar. 25, 1974, Ser. No. 454,598
Int. Cl. G06g *7/12, 7/48*
U.S. Cl. 235—193 **2 Claims**



1. Apparatus for wave analysis comprising:

means to sense water level and produce a first output signal proportional to said water level;

first operational amplifier means responsive to said first output signal and to a second output signal to subtract from said first output signal, said second output signal, and to output said difference as a third output signal;

frequency filtering means responsive to said third output signal to pass only frequencies less than a predetermined maximum for output as a fourth output signal;

second operational amplifier means responsive to said fourth output signal to integrate said fourth output signal over a predetermined time period for output as said second output signal to said first operational amplifier means, said second output signal being an indication of the mean tide level;

actuating means to provide a reset signal, the time interval between the pulses of said reset signal determining the duration of a second predetermined time period;

third operational amplifier means responsive to said fourth output signal to square said fourth output signal for output as a fifth output signal;

fourth operational amplifier means responsive to said fifth output signal to integrate said fifth output signal over said second time period for output as a sixth output signal, said fourth operational amplifier means being reset by said reset signal; and

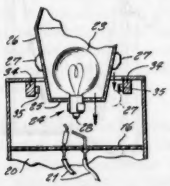
fifth operational amplifier means responsive to said sixth output signal to take the square root of said sixth output signal for output as an indication of the average root mean square wave height.

3,899,669

TWO POSITION LIGHTING DEVICE

Albert Nathanson, 75-60 199th St., Flushing, N.Y. 11366

Filed Apr. 1, 1974, Ser. No. 456,776
Int. Cl.² F21L *15/00*
U.S. Cl. 240—10.6 R **2 Claims**



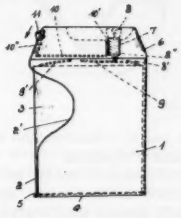
1. In a two position lighting device the combination of a socket base and a lamp bulb unit engagable therewith, wherein said bulb unit comprises a lamp bulb having a stem, a translucent enclosure surrounding said bulb, said stem of said lamp protruding from said enclosure, said stem including a tip contact and a cylindrical side contact having a mid portion and insulating means partially surrounding said mid portion, said socket base comprises a casing, an opening in said casing, means electrically engagable with said contacts of said bulb unit when said bulb unit is partially inserted into said opening and when said unit is completely inserted and rotated into its final position within said opening, said means being out of electrical engagement with said contacts when said bulb unit is completely inserted into said opening without rotation.

3,899,670

FLASHLIGHT CASING FOR A FLAT-SHAPED BATTERY

Pierre Delfortrie, Les Sorbiers, Tiege Sart Lez-Spa, Belgium

Filed Aug. 2, 1973, Ser. No. 384,905
Int. Cl. F21l *9/00*
U.S. Cl. 240—10.65 **1 Claim**



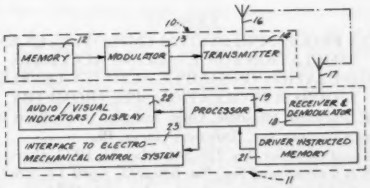
1. In combination, a flashlight housing having a pair of side walls, a pair of end walls, a bottom wall and a head cover, a flat battery and a light bulb, said pair of side walls and one of said end walls having cutout portions for insertion of said battery without removing said head cover, said electric bulb having a cap terminal and a central terminal, said central terminal being in constant contact with one terminal of the battery, a clamp for holding said cap terminal, and a strip having a folded end operable by a push button for contacting the other terminal of said battery with said clamp, said bottom wall comprising a central longitudinal projection along its internal surface frictionally engaging said battery to secure the battery in the housing.

3,899,671

COMMUNICATION SYSTEMS

Harris A. Stover, 10306 Mountington Ct., Vienna, Va. 22180

Filed Feb. 27, 1974, Ser. No. 446,239
Int. Cl. G08g *1/09;* **G06f** *15/50*
U.S. Cl. 235—150.2 **11 Claims**



1. A ground vehicle system comprising, a plurality of fixed transmitters installed at different locations along a highway, modulator means connected to each of said fixed transmitters, memory means connected to each of said modulator means to supply highway intelligence, a receiver mounted on a vehicle and tuned to receive information from said fixed transmitters, a data processor connected to said receiver, a vehicle memory connected to said data processor, utilization means connected

to said data processor to utilize selected information transmitted by said fixed transmitters, and wherein said vehicle memory selects information from the received information relevant to stop signs.

3,899,672

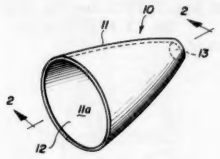
SOLAR ENERGY COLLECTION

Riccardo Levi-Setti, Chicago, Ill., assignor to The University of Chicago, Chicago, Ill.

Filed Feb. 19, 1974, Ser. No. 443,615

Int. Cl. G02b *5/10*

U.S. Cl. 350—293 **10 Claims**



1. Apparatus for use in collection and utilization of solar energy, said apparatus comprising:

at least one generally conical-shaped, non-imaging, primary solar energy concentrator element, said element including a substantially circular solar energy entrance aperture of a diameter d_1, a substantially circular solar energy exit aperture spaced apart from said entrance aperture and having a diameter d_2 which is less than the diameter d_1 of said entrance aperture, and solar energy reflective wall means extending from said entrance aperture to said exit aperture for directing solar energy entering the element at said entrance aperture toward said exit aperture, the profile curve of said wall means revealing symmetrical substantially concave curved segments,

said solar energy concentrator element comprising means, including the dimensions of said apertures, the distance separating said apertures and the curvature of said wall means, which permits concentration of solar energy by a factor of $(d_1/d_2)^2$ with the concentration element in a fixed position and without tracking of apparent solar motion, for a time period, in hours, equal to,

$(24/\pi)$ arc tan (Sin θ_{max}/cos T)

wherein: θ_{max} is the half field of view of the concentrator element, and T is equal to $\pi/2$ minus the angle, α, between the earth's axis of rotation and the earth-sun direction;

and a hollow solar energy trap means disposed at said exit aperture of said concentrator element.

3,899,673

DATA PROCESSING SYSTEM EMPLOYING QUENCH SIMULATION FOR ENABLING ACCURATE COMPUTATION OF SAMPLE ACTIVITY LEVELS IN LIQUID SCINTILLATION SPECTROMETRY

Lyle E. Packard, Hinsdale, Ohio, assignor to Packard Instrument Company Inc., Downers Grove, Ill.

Continuation of Ser. No. 256,546, May 24, 1972, abandoned, which is a division of Ser. No. 630,892, April 14, 1967, Pat. No. 3,688,120. This application June 21, 1974, Ser. No. 481,868

Int. Cl. G01t *7/02*

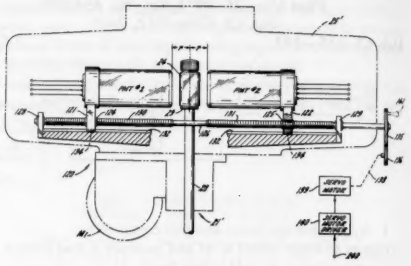
U.S. Cl. 250—328 **23 Claims**

1. A method of measuring the radioactivity of a sample containing at least one radioactive isotope disposed in a liquid scintillation medium comprising the steps of

a. determining the value of a selected quench correlation parameter for a standard material,

b. measuring said selected quench correlation parameter for a quenched sample,

c. terminating the measuring of the selected quench correlation parameter for said sample and generating an output signal representing the difference between the value of the quench correlation parameter determined for the standard material and the value of the quench correlation parameter measured for said sample,



d. generating a control signal as a function of said output signal and representing an adjustment required of an operating parameter to make the value of the quench correlation parameter measured for said sample substantially equal to the value of the quench correlation parameter determined for the standard material,

e. adjusting said operating parameter in response to said control signal, and

f. measuring the activity level of said sample after said adjustment of said operating parameter.

3,899,674

CRYOGENIC RADIATORS FOR RADIOMETERS, AND MORE PARTICULARLY FOR SATELLITE-SUPPORTED RADIOMETERS

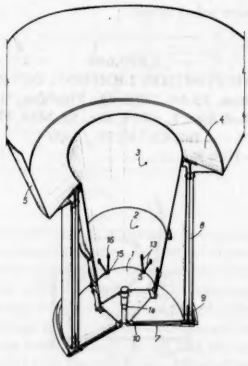
Lionel Decramer, Lasbordes-Balma, and Philippe Mauroy, Saint-Orens, both of France, assignors to Centre National d'Etudes Spatiales, Paris, France

Filed Mar. 21, 1974, Ser. No. 453,339

Claims priority, application France, July 13, 1973, 73.25754

Int. Cl.[2] G01J *1/00*

U.S. Cl. 250—352 **15 Claims**



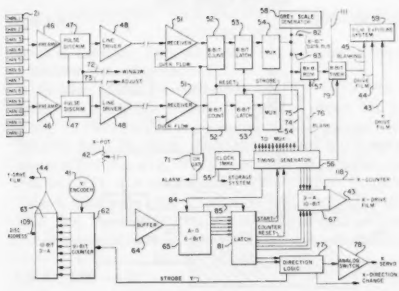
1. A structure substantially of revolution about an axis, including upper and lower outwardly open frusto-conical

coaxial screens functioning as radiant stages, said screens being thermally insulated toward the exterior, having high reflecting capacity on their interior faces with respect to infrared radiation and arranged to reflect radiation from the sun and other bodies arriving at incidence angles in excess of 65° with respect to said axis, a cryogenic radiator which behaves substantially as a black body with respect to infrared radiation and as a reflector with respect to solar radiation, said radiator including a radiometer platform fitted on board a satellite in space at a cryogenic temperature of approximately 80°K and means for supporting said radiator within said screens, the upper one of said screens being wider than and positioned above the other screen over virtually its entire height in the direction of divergence of the screens, the mutually facing surfaces thereof corresponding to only a small fraction of said height, the upper screen functioning primarily as a sunshade for said radiation with respect to direct solar radiation and reflecting back into space the greater part of the other external fluxes, the lower screen facilitating radiation from the radiator into space and protecting said radiator against infrared radiation from said upper screen and against possible solar radiation diffused thereby.

3,899,675
WHOLE BODY IMAGING

Roger F. Floyd, Hudson, N.H., assignor to Cleon Corporation, Needham, Mass.

Filed Mar. 4, 1974, Ser. No. 447,989
Int. Cl. G01t *1/20*
U.S. Cl. 250—369 **4 Claims**



1. In a radiant energy imaging apparatus having patient support means for supporting a patient with the length of the patient aligned along a longitudinal direction, a plurality of spaced radiant energy detecting means aligned along a curve in a direction generally transverse to said longitudinal direction for providing respective signals representative of radiant energy emanating from correspondingly spaced points on a patient when on said patient support means, means for moving said detecting means back and forth along said curve to scan substantially the entire projection of said curve upon said patient support means, and means for advancing said detecting means along said longitudinal direction at a speed less than that of the speed of said detecting means along said curve to scan the entire patient, the improvement comprising,

means responsive to the position of said detecting means for providing digital position signals representative of a rectilinear array of points embracing a patient when on said patient support means,

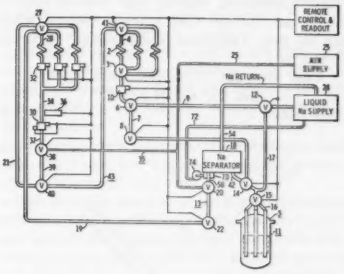
a cathode ray tube,

and means responsive to the signals provided by said detecting means and said digital position signals for illuminating a corresponding rectilinear sequence of spots on said cathode ray tube representative of said array of points with the energy intensity of each illuminated spot corresponding to the radiant energy then being received by a detector from a corresponding one of said array of points.

3,899,676
APPARATUS FOR POWER AND BREEDING DISTRIBUTION MEASUREMENTS IN BREEDER REACTORS

Norman P. Goldstein, and Kuan H. Sun, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 88,605, Nov. 12, 1970, Pat. No. T901,026. This application Feb. 5, 1973, Ser. No. 329,915
Int. Cl. G01t *3/00*
U.S. Cl. 250—390 **14 Claims**



1. Apparatus for measuring the breeding distribution within a liquid metal cooled fast breeder power reactor having a fuel inventory including fertile material, said apparatus comprising a plurality of detectors formed in part from neutron flux sensitive fertile material, said flux sensitive material having substantially the same energy dependence of its neutron interaction probability as the fertile material in said fuel inventory, means for inserting and distributing said detectors within said reactor in a predetermined arrangement so as to be activated by said reactor, means for withdrawing said detectors from said reactor, wherein said inserting means and withdrawing means employ a liquid transfer medium compatible with the reactor coolant to drive said detectors and means for measuring in conformance with said arrangement the radiation emitted from the end products produced by the activation of sensitive fertile material.

3,899,677
PLASTIC FOR INDICATING A RADIATION DOSE

Yutaka Hori; Nobuharu Yoshikawa, and Saburo Ohmori, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Continuation of Ser. No. 260,242, June 6, 1972, abandoned, which is a continuation of Ser. No. 840,478, July 9, 1969. Claims priority, application Japan, July 9, 1968, 43-48308; July 9, 1968, 43-48309
Int. Cl. G01t *1/12*
U.S. Cl. 250—474 **17 Claims**

1. A film comprising a stable plastic composition coated on one side of a carrier and an adhesive layer coated on at least a portion of the other side of said carrier, said stable plastic composition indicating a radiation dose by a distinct change or loss of color when irradiated with ionizing radiation, said composition consisting essentially of:

a. a moldable chlorine-containing polymer having a chlorine content of from 30 to 80 percent by weight based on the weight of the polymer, said polymer releasing hydrogen chloride when irradiated with ionizing radiation;

b. from 0.1 to 5 parts by weight, based on 100 parts by weight of said polymer, of aniline blue as an acid-sensitive coloring agent, and, at least one other acid-sensitive coloring agent which discolors or loses color, upon irradiation with ionizing radiation, by the action of the hydrogen chloride released from said polymer; and

c. from 5 to 80 parts by weight, based on 100 parts by weight of said polymer, of a plasticizer which does not

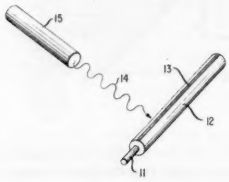
react with or inhibit the function of the hydrogen chloride released by said polymer upon irradiation with ionizing radiation and which has good color stability after irradiation with ionizing radiation, said plasticizer being selected from the group consisting of phosphoric acid esters, polyesters, chlorinated paraffins, and trimellitic esters of aliphatic alcohols.

3,899,678

RADIATION SENSITIVE MARKING AND PROCESS UTILIZING SAME

Edwin Arthur Chandross, Murray Hill; Coralie Anne Pryde, Morristown, and Warren Allen Salmon, Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 20, 1974, Ser. No. 452,850
Int. Cl.[2] G01N *21/38*
U.S. Cl. 250—484 **13 Claims**



1. Article of manufacture comprising a body of a material whose processing comprises exposure to electron radiation characterized in that at least a portion of said article's surface includes a radiation indicator comprising, prior to electron irradiation, a compound which is a polyarylated bicyclo-[2,2,1]-heptene-7-one which, when irradiated with electrons, at least in part transforms by decarbonylation into a cyclohexa-1,3-diene, whereby the said indicator is rendered fluorescent when exposed to ultraviolet light including a wavelength within the range of from 300 to 400 nanometers.

3,899,679

MANGANESE ACTIVATED PHOSPHATE GLASS FOR DOSIMETRY

Dieter Regulla, Munich, Germany, assignor to Gesellschaft fur Strahlen-und Umweltforschung mbH, Munich, Germany

Filed Nov. 21, 1973, Ser. No. 417,754
Int. Cl. G01t *1/11*
U.S. Cl. 250—484 **4 Claims**

1. Measuring element for detecting ionizing radiation and determining radiation doses in the range from milliroentgen to more than 10 megaroentgens by radiation induced thermoluminescence, comprising a metaphosphate glass doped with manganese as an activator for increasing thermoluminescence yield.

3,899,680

PROTECTED ISOTOPE HEAT SOURCE

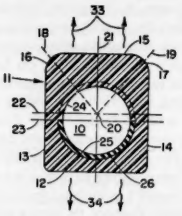
Raymond K. Burns, Lakewood; Lloyd I. Shure, Willowick, both of Ohio, and Elliott D. Katzen, Palo Alto, Calif., assignors to The United States of America as represented by the United States Aeronautics and Space Administration, Washington, D.C.

Filed May 26, 1971, Ser. No. 146,939
Int. Cl. G21h *5/00*; G21f *5/02*
U.S. Cl. 250—496 **10 Claims**

1. An isotope heat source for atmospheric reentry comprising:

a container having a cavity therein and having a flat front face, flat side surfaces and a rear face which merges with said flat side surfaces along respective curved surfaces which extend from one end of the container to the other;

an isotope capsule disposed in said cavity of said container, said capsule being substantially smaller than said cavity, and being in direct contact over a substantial



portion of its surface with the cavity wall adjacent said rear face of said container; and

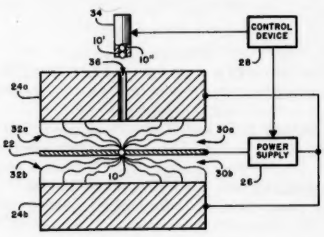
a heat insulating layer disposed between said capsule and the well of said cavity adjacent said flat front face.

3,899,681

ELECTRON BEAM DEVICE

Everet H. Beckner, and Milton J. Clauser, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 1, 1974, Ser. No. 457,673
Int. Cl. G21b *1/00*
U.S. Cl. 250—502 **8 Claims**



1. An electron beam device comprising a target consisting essentially of a hollow shell of an electron absorbing material, said shell having a thickness to diameter ratio of from about 1 to 5 to about 1 to 50, a thickness of from about 0.1 to 1.0 mm sufficient to absorb in outer portions of said shell substantially all electrons impinging on the shell, and hydrogen isotope disposed in the interior thereof; and means adjacent and generally encircling said shell for producing a high energy pulse beam of electrons circumferentially encompassing and focused on and substantially encircling said target for accelerating inner portions of said shell inwardly against said hydrogen isotope.

3,899,682

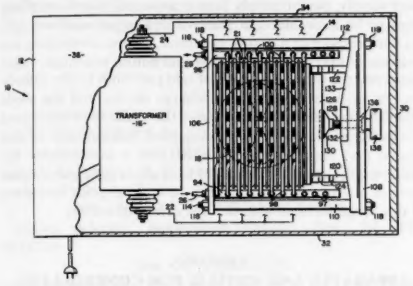
CORONA REACTOR METHOD AND APPARATUS

Frank Eugene Lowther, Phelps, N.Y., assignor to Purification Sciences Inc., Geneva, N.Y.

Division of Ser. No. 830,248, June 4, 1969, Pat. No. 3,798,457.
This application July 16, 1973, Ser. No. 379,844
Int. Cl.[2] C01B *13/12*
U.S. Cl. 250—532 **10 Claims**

1. An electrode for use as one of a pair of electrodes in a corona reactor cell of a corona reactor adapted to expose a fluid to a corona discharge produced in a corona discharge chamber between the interior surface of each of a pair of

corona reactor electrodes, said electrode comprising a flat, rectangular, planar, metal plate having a continuous peripheral edge that curves away from the plane of the plate in a direction away from the interior surface thereof, said curving edge including the entire peripheral edge of said plate, said



curving edge having a uniform width and height, and said electrode having a ceramic dielectric coating covering the entire area of said interior surface of said plate, and said plate being imperforate except for only a pair of spaced-apart passageways extending transversely completely through said plate and coating.

3,899,683

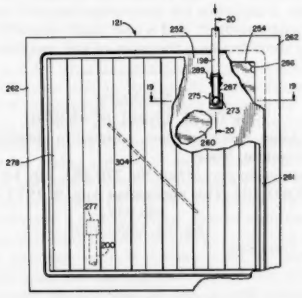
DIELECTRIC LIQUID-IMMERSED CORONA GENERATOR

Frank E. Lowther, Severna Park, Md., assignor to Purification Sciences Inc., Geneva, N.Y.

Division of Ser. No. 281,451, Aug. 17, 1973, Pat. No. 3,836,786, which is a continuation-in-part of Ser. No. 141,148, May 7, 1971, which is a continuation-in-part of Ser. No. 709,485, Feb. 29, 1968, abandoned, which is a continuation-n-part of Ser. No. 612,751, Jan. 4, 1967, abandoned, said Ser. No. 281,451, is a continuation-in-part of Ser. No. 830,248, June 4, 1969, Pat. No. 3,798,457. This application Oct. 26, 1973, Ser. No. 409,802The portion of the term of this patent subsequent to Sept. 17, 1991, has been disclaimed.

Int. Cl.[2] C01B *13/12*

U.S. Cl. 250—532 **16 Claims**



1. A dielectric liquid-immersed corona generator comprising:

a. a fluid-tight housing;

b. a heat exchanger;

c. means for pumping a dielectric liquid from said housing to said heat exchanger and back to said housing;

d. a corona generator positioned within said housing and including a plurality of gas-tight corona generating cells, each cell comprising a pair of flat, solid, spaced-apart electrodes forming a corona discharge chamber between inner facing surfaces of said electrodes, a layer of dielectric material coated on the inner surface of each of said electrodes, a gasket positioned between said pair of electrodes adjacent the peripheries thereof and defining, along with said inner facing surfaces of said pair of electrodes, said corona discharge chamber therewithin, said gasket also determining the thickness of said corona discharge chamber and a spacer element positioned between each adjacent pair of cells and in contact with the external surface of the adjacent electrodes of the adjacent cells, said spacer elements including gas passageways therethrough, and including means for holding said cells and said spacer elements together;

e. a gas inlet and a gas outlet conduit extending through said housing and into gas communication with the corona discharge chamber of each of said cells for feeding oxygen-containing gas into the ozone-containing gas from, said chambers;

f. means including a solid electrical conductor connected to said electrodes for applying a voltage across the electrodes of each of said cells, and

g. a disc centrally located in each of said discharge chambers and having a thickness substantially equal to that of said gasket for maintaining said electrodes flat and providing a more uniform air flow through said chamber.

16. A method for preventing electrical discharge between the adjacent peripheries of a pair of spaced-apart electrodes of an airtight corona generating cell, said electrodes including internal surfaces defining a corona generating chamber and external heat exchange surfaces, said method comprising immersing said cell in a dielectric liquid and surrounding said peripheries with said dielectric liquid, cooling said liquid whereby said liquid serves to simultaneously prevent said discharge and to cool said cell, providing a plurality of said cells in a housing, filling said housing with said dielectric liquid, and circulating said dielectric liquid from said housing to a cooler and back to said housing, said electrodes being flat and parallel and providing a stack of said cells spaced apart by spacer means contacting said external surfaces and providing liquid coolant passageways through said spacers, providing a gasket of fluorosilicon rubber material between each pair of electrodes of each cell adjacent the peripheries of said electrodes for setting the distance therebetween, and maintaining said electrodes flat by providing a disc centrally located between each pair of electrodes of each cell and having a thickness substantially equal to the thickness of each of said gaskets.

3,899,684

CONTROL SYSTEM FOR CORONA DISCHARGE OZONE GENERATING UNIT

Robert I. Tenney, Deerfield, Ill., assignor to Ozone Incorporated, Deerfield, Ill.

Filed June 3, 1974, Ser. No. 475,760

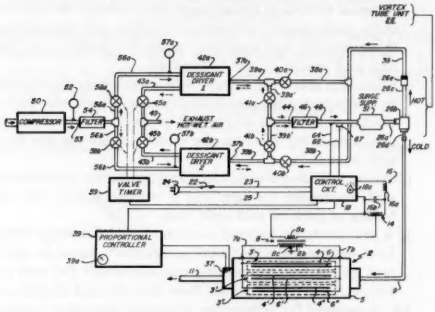
Int. Cl. C01b *13/12*; **F25b** *9/02*

U.S. Cl. 250—535 **11 Claims**

1. In an ozone generating system including a corona discharge ozone generating unit for ozonizing an oxygen containing gas, the ozonized gas rapidly dissociating at temperatures above a given value, the ozone generating unit including at least one pair of electrodes to be connected to the terminals of a high voltage source and a heat damageable dielectric tube between said electrodes, a source of ozone producing high voltage to be operably connected to said electrodes and means for circulating the oxygen containing gas to be ozonized through said corona discharge generating unit, the improvement in means for controlling the operation of the ozone generating system, said means comprising temperature responsive means responsive to the temperature of the ozonized gas, and control means responsive to said temperature responsive means for interrupting the coupling of said ozone producing high voltage to said electrodes of the ozone generating unit

when the temperature of the ozonized gas reaches a level below the temperature at which said ozonized gas rapidly dissociates, the circulation of the gas to be ozonized through said unit continuing during said interruption of the high voltage.

6. The ozone generating system of claim 5 wherein there is provided a vortex tube unit for receiving gas to be ozonized at a first inlet and separating the high energy gas molecules from the low energy gas molecules therein and delivering the resultant relatively cool gas molecules to a cool gas outlet thereof and the relatively warm gas molecules to a warm gas outlet thereof, said cool gas outlet being connected to the inlet of the ozone generating unit, said vortex tube unit requiring gas of at least a given pressure to be operable and there is provided pressure responsive means responsive to the pressure of the gas to be ozonized being fed to the inlet of said vortex tube unit and means for preventing the coupling of high voltage to said electrodes of the ozone generating unit until the pressure reaches said given pressure.



3,899,685

OZONISERS

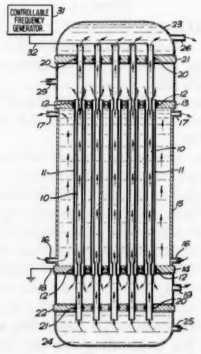
Peter Douglas Francis; Ronald Albert Redford, both of Chester; Philip Franklin Gale, and Maurice Raymond Hillis, both of Cheshire, all of England, assignors to The Electricity Council, London, England

Filed Mar. 22, 1973, Ser. No. 343,761

Claims priority, application United Kingdom, Mar. 23, 1972, 13759/72

Int. Cl.[2] C01B *13/12*

U.S. Cl. 250—536 **6 Claims**



1. An ozoniser having at least one pair of electrodes with an oxygen-containing gas and dielectric material in the gap between the electrodes wherein means are provided for applying between said electrodes a direct potential, switched to be alternately of opposite polarity, said means comprising a step-up transformer having primary and secondary windings with at least one primary winding arranged for energisation from an alternating power supply source, rectifying means connected to said secondary windings to produce a high voltage direct power supply, power supply lines connected to said rectifying means to be maintained at positive and negative direct voltages with respect to a datum potential, means connecting one electrode of said pair to a point at said datum potential, means connecting the other electrode of said pair both to the cathode of a first grid-controlled gas discharge device and the anode of the first gas discharge device and the cathode of the second gas discharge device being connected respectively to said positive and negative supply lines, and a controllable frequency pulse generator arranged to apply trigger pulses alternately at a controllable frequency to control grids of the two gas discharge devices whereby they fire alternately.

3,899,686

APPARATUS AND METHOD FOR CONTROLLING REGISTRATION

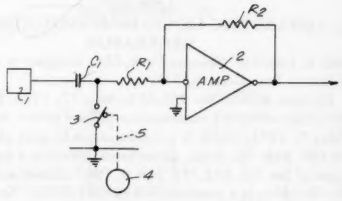
Zdenek Luska, Lausanne, Switzerland, assignor to J. Bobst & Fils S.A., Switzerland

Filed Oct. 17, 1973, Ser. No. 407,187

Claims priority, application Switzerland, Oct. 27, 1972, 1571372

Int. Cl. G01j *5/00*

U.S. Cl. 250—555 **10 Claims**



1. In a system for controlling registration in a multistage process comprising means for generating a pulse in response to detection of a data mark on a strip of material being processed by said multistage process, an amplifier for amplifying said pulse, a capacitor for interconnecting said pulse generator and said amplifier, and a selectively operable switch for normally shortcircuiting the input of said amplifier.

3,899,687

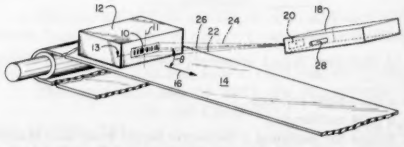
OPTICAL LABEL SCANNING

Paul W. Jones, Franklin, Mass., assignor to Identicon Corporation, Franklin, Mass.

Continuation-in-part of Ser. No. 270,203, July 10, 1972, Pat. No. 3,801,182. This application Aug. 9, 1973, Ser. No. 386,957

Int. Cl. G08c *9/06*

U.S. Cl. 250—568 **7 Claims**



1. Label reading apparatus comprising,

scanning means having a field of view for scanning along a first direction a label carrying a bar code and including detecting means responsive to radiant energy from said

label for providing a signal representative of the bar code when the label is within said field of view,

means for supporting an item carrying said label and relatively displacing said scanning means and said item in a second direction generally perpendicular to both said first direction and the plane of said label,

whereby said label enters said field of view,

and means for interpreting said signal.

3,899,688

DEVICE FOR CHECKING THE CONTENT OF HYDROCARBONS IN A MIXTURE OF WATER AND HYDROCARBONS

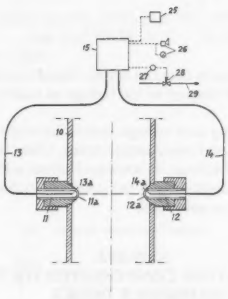
Jacques A. Périères, 3, Residence Beaumanoir-Allee des Lilas, Aix-en-Provence, France

Filed Nov. 14, 1973, Ser. No. 415,824

Claims priority, application France, Nov. 24, 1972, 72.42946

Int. Cl.[2] G01N *21/26*

U.S. Cl. 250—576 **3 Claims**



1. Apparatus for checking the content of hydrocarbons in a mixture of water and hydrocarbons which flows from a reservoir and comprising drain piping adapted to be connected to said reservoir, a volumetric pump having a predetermined pumping capacity, said pump being connected to said drain piping for taking samples of said mixture therefrom, a delivery pipe connected to an outlet side of said pump for conveying said samples to discharge, said delivery pipe having a starting point and a delivery point, spaced therefrom, both points being upstream of said discharge, and said delivery point being upstream of said starting point, a loop circuit connected between said starting and said delivery points and including as part thereof that portion of said delivery pipe between said starting and said delivery points, said loop circuit including (a) a pipe through which said samples circulate (b) an optical detector comprising a light emitter and receiver, each being disposed inside a separate tube, one end of each tube being terminated by a transparent cap which projects inside said sample circulating pipe from opposite sides thereof, (c) an emulsifier pump upstream of said detector and having a pumping capacity greater than said predetermined pumping capacity of said volumetric pump whereby samples of the mixture are recycled several times through said emulsion pump and past said optical detector before discharge.

3,899,689

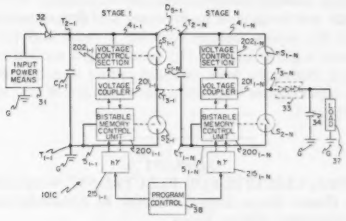
ELECTRIC POWER SOURCE

Richard H. Baker, Bedford, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 256,811, May 25, 1972, Pat. No. 3,748,492. This application May 15, 1973, Ser. No. 360,501The portion of the term of this patent subsequent to July 24, 1990, has been disclaimed.

Int. Cl. H02m *7/00*

U.S. Cl. 307—117 **68 Claims**



1. An electric system that comprises a plurality of stages connected in cascade, each stage including, in combination, supply voltage means connected along two alternate paths to an electric terminal of the stage, semiconductor switch means connected between the supply voltage means and the terminal and operable to determine which of the two paths is conductive thereby to determine which side of the supply voltage means is connected to the terminal, a light-actuated bistable memory and control circuit connected to control the switch means, said bistable memory and control circuit having a bistable portion, one state of the bistable portion of the circuit acting to render conductive one of said paths and the other state of the bistable portion of the circuit acting to render conductive the other of said paths as alternate conditions of system operation, a voltage control section that includes a plurality of field effect transistors and a voltage coupler connected between the bistable memory and control circuit and the voltage control section.

3,899,690

CONTROL DEVICE DETECTING SIGNAL DEVIATIONS FROM THRESHOLD VALUES

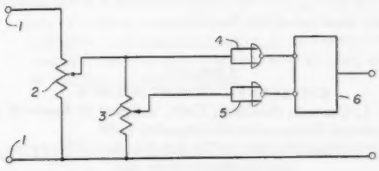
Jose Luis Gomez Llona, and Rodolfo Di Pietro Elizaran, both of Munguia (Vizcaya), Spain, assignors to Arteche Instrumentacion Y Sistemas Electronicos, S.A., Munguia (Vizcaya), Spain

Filed May 8, 1974, Ser. No. 467,910

Claims priority, application Spain, May 10, 1973, 414.624

Int. Cl. H03k *19/34*

U.S. Cl. 307—215 **13 Claims**



1. An electrical signal detection system for generating a control signal in response to variations of an input signal, comprising:

first means (2) coupled to said input signal and providing a first signal which is a fraction of said input signal;

second means (3) coupled to the output of said first means (2) and providing a second signal which is a fraction of said first signal of said first means (2);

a first logic device (4) coupled to the output of said first means (2);

a second logic device (5) coupled to the output of said second means (3); and

a third logic device (6) having at least two inputs, two inputs of which are respectively coupled to the outputs of said first and second logic devices (4,5) for generating (i) a first output signal when the two input signals coupled thereto coincide in time and are at identical first logic levels, and holding or maintaining said first output signal until the inputs thereto coincide in time and are of a second logic level, and (ii) generating a second output signal, distinctive from said first output signal, when said two input signals coincide in time and are of said second logic level.

3,899,691

DRIVING CIRCUITS FOR ELECTRONIC WATCHES

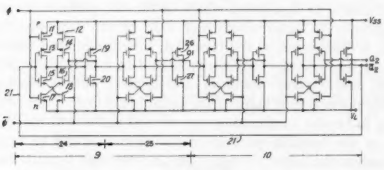
Tetsuro Hama, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Nov. 9, 1973, Ser. No. 414,572

Claims priority, application Japan, Mar. 31, 1971, 46-19075

Int. Cl.[2] H03K *23/08*

U.S. Cl. 307—223 C **6 Claims**



1. A driving circuit for an electronic watch comprising oscillator means for producing a high frequency time standard signal; and divider means coupled to said oscillator means to receive said time standard signal for dividing the frequency of said time standard signal to produce low frequency timing signals for time indication, said divider means including ring counter circuit means formed from MOS transistors, said ring counter circuit means being divide-by-2*n* ring counter means, wherein *n* is an integer and equal to the number of stages of said ring counter means, each of said ring counter stages having a write terminal and an output terminal, the output terminal of each of said stages other than the last stage being connected to the write terminal of the next succeeding stage; first and second control terminals having first and second control signals respectively applied thereto; means operatively coupling said first and second control terminals to each of said stages for the control thereof; and means for applying the inverse of the signal at the output terminal of the last stage to the write terminal of the first stage.

3,899,692

CONSTANT CURRENT SOURCE

Robert L. Caswell, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 10, 1973, Ser. No. 423,620

Int. Cl. H03k *4/12, 4/24*

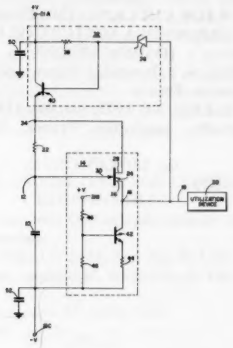
U.S. Cl. 307—228 **6 Claims**

1. In combination:

high input impedance voltage follower means having an input terminal connected to a load and having an output terminal isolated from said input terminal, said voltage follower means comprising a field effect transistor having a source, drain, and gate electrodes, said gate electrode connected to said input terminal and said source electrode connected to said output terminal;

impedance means connected to said input terminal;

a voltage source, said voltage source comprising a voltage regulator having a first terminal thereof connected to said voltage follower output terminal and having a second terminal thereof connected to a point common with said impedance means and said drain electrode of said field



effect transistor in order to supply thereto a voltage signal regulated with respect to the voltage at said output terminal; and

means connecting said voltage source between said output terminal and said impedance means, whereby a substantially constant voltage is developed across said impedance means for establishing a substantially constant current therethrough to said load.

3,899,693

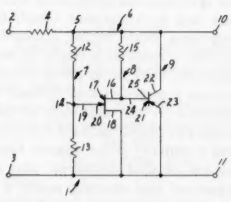
TEMPERATURE COMPENSATED VOLTAGE REFERENCE DEVICE

Eugene H. Gaudreault, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 14, 1974, Ser. No. 442,422

Int. Cl. H03k *1/14, 1/04*

U.S. Cl. 307—297 **6 Claims**



1. A temperature compensated voltage reference device for monitoring at least a portion of an applied input voltage and providing an output control signal when the applied input voltage reaches a predetermined nonzero level, which reference device comprises:

a pair of output terminals;

a pair of input terminals to which said input voltage is applied;

a source of bias voltage;

a bipolar transistor having a base terminal, a collector terminal connected to one of said output terminals, and an emitter terminal connected to the other of said output

terminals, which transistor has a temperature dependent junction voltage across its base to emitter junction;

a field effect transistor having a gate terminal, a drain terminal connected to said other of said output terminals, and a source terminal connected to the base terminal of said bipolar transistor, which transistor has a temperature dependent bias voltage across its gate to source junction;

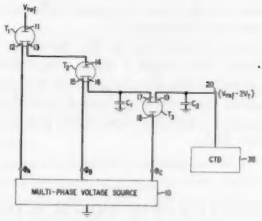
a biasing means connected across said input terminals and joined to the gate of said field effect transistor to bias the same near a pinched-off condition; and

a resistive means connected at one end to said source of bias voltage and connected at an opposite end to the source terminal of said field effect transistor so that current flow through said bipolar transistor is increased when current flow through said field effect transistor decreases, and temperature variations in the bias voltage of said field effect transistor are substantially negated by temperature variations in the junction voltage of said bipolar transistor.

3,899,694
COMPENSATING REFERENCE VOLTAGE CIRCUIT FOR SEMICONDUCTOR APPARATUS

Michael Francis Tompsett, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 8, 1974, Ser. No. 440,643
Int. Cl.[2] H03K *3/353, 19/08*
U.S. Cl. 307—304 **11 Claims**



1. A circuit which comprises

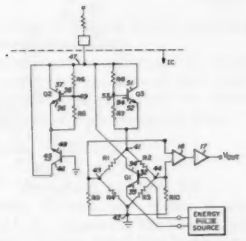
a. a first field effect transistor having a low current carrying terminal controlled by and connected to a reference voltage terminal and having a first high current carrying terminal controlled by and connected to a first clock pulse terminal; and

b. a second field effect transistor having a low current carrying terminal controlled by and connected to a second high current carrying terminal of the first transistor and having a first high current carrying terminal controlled by and connected to a second clock pulse terminal, said first and second clock terminals for providing pulses sufficient that the first transistor periodically be ON and OFF while the second transistor be ON only when the first transistor is OFF and that the second transistor be OFF otherwise.

3,899,695
SEMICONDUCTOR PRESSURE TRANSDUCER EMPLOYING NOVEL TEMPERATURE COMPENSATION MEANS

James E. Solomon, Saratoga, and Arthur R. Zias, Palo Alto, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 400,355, Sept. 24, 1973, Pat. No. 3,836,796. This application Sept. 16, 1974, Ser. No. 506,419The portion of the term of this patent subsequent to Sept. 17, 1991, has been disclaimed.
Int. Cl.[2] H01V *3/00;* **H03K** *3/26*
U.S. Cl. 307—310 **6 Claims**



1. A semiconductor pressure transducer apparatus comprising:

a semiconductor body comprising a substrate and a surface layer of a material of a first conductivity type, said body having a cavity region formed therein, said cavity region including a thin wall section formed by a section of said surface layer, said thin wall section being flexible responsive to pressure exerted across said thin wall section,

an electrical bridge circuit formed in said thin wall section of said surface layer and comprising four resistor arms, two opposed nodes of said bridge forming a bridge input, the two other opposed nodes of said bridge forming a bridge output, each of said bridge resistors being formed by a diffusion of a dopant of opposite conductivity type to that of the surface layer into said thin semiconductor wall section,

circuit means for applying a voltage to the input nodes of said bridge circuit, said circuit means including a common collector node formed by said layer of said semiconductor material of said first conductivity type,

a voltage regulator circuit coupled across said common collector node and one input node of said bridge,

and a temperature compensation circuit for said bridge coupled between another input node of said bridge and said common collector node comprising:

a transistor formed in said surface layer having an emitter coupled to said other bridge input node, a collector coupled to said common collector node, and a base, and

a pair of resistors coupled in series between said common collector node and the emitter of said transistor, the junction node between said two resistors being coupled to the base of said transistor.

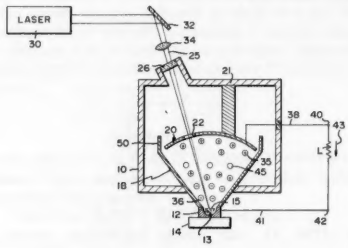
3,899,696
ELECTRIC POWER GENERATION SYSTEM DIRECTLY FROM LASER POWER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and Katsunori Shimada, Pasadena, Calif.

Filed Mar. 27, 1974, Ser. No. 455,165
Int. Cl.[2] H01V *45/00*
U.S. Cl. 310—4 **13 Claims**

1. A system comprising:

a source of liquid cesium;
a laser for providing a laser beam;
first means in the path of said laser beam for directing said beam to said liquid cesium, to vaporize some of said liquid cesium and to ionize at least some of said vaporized cesium into cesium ions and electrons by the collisions between the beam photons and the vaporized cesium atoms; and
collector means electrically insulated from said liquid cesium source and spaced apart therefrom, said collector means having a work function which is different from the

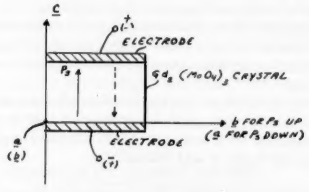


work function of said liquid cesium whereby either said ions or said electrons, formed when said cesium vapor is ionized, are attracted to said collector means, thereby generating a potential difference between said liquid cesium and said collector means, said laser beam ionizing only part of the cesium vaporized by said laser beam, whereby some neutral cesium atoms are present between said liquid cesium and said collector means, the latter being at a temperature which is sufficiently higher than said liquid cesium source, to repel the neutral cesium atoms from said collector means toward said liquid cesium source.

3,899,697
BISTABLE POSITIONER COMPRISING A DIMENSIONALLY BISTABLE FERROELECTRIC CRYSTAL

Stewart E. Cummins, 11810 Stafford, New Carlisle, Ohio 45344

Continuation of Ser. No. 143,598, May 14, 1971, abandoned, which is a continuation of Ser. No. 814,406, April 8, 1969, abandoned. This application June 19, 1972, Ser. No. 263,896
Int. Cl. H01v *7/00*
U.S. Cl. 310—8 **9 Claims**

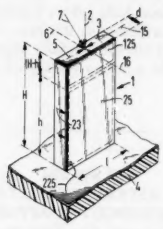


1. The method of bistably positioning a first element with respect to a second element comprising: attaching a crystal of a molybdate of a rare earth at one point on the crystal to the first element and at another point on the crystal to the second element, said crystal having orthorhombic crystallographic axes conventionally designated *a*, *b*, and *c* and said points of attachment lying on a line parallel to one of the *a* and *b* axes; and momentarily subjecting said crystal to an electric field that is parallel to the *c* axis, of polarity determined by which of the two stable positions is occupied by the first element, and of magnitude exceeding the coercive field of the crystal.

3,899,698
PIEZOELECTRIC KEY

Peter Kleinschmidt, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 18, 1974, Ser. No. 452,060
Claims priority, application Germany, Mar. 22, 1973, 2314420
Int. Cl.² H01L *41/10*
U.S. Cl. 310—9.5 **41 Claims**

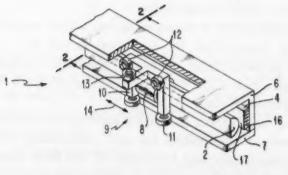


1. A key for controlling an amplifier of an electronic circuit in response to the application thereto of an intentionally applied and dimensioned compressive force, comprising:
a piezoelectric transducer including a body of piezoceramic material for receiving the compressive force,
a pair of electrodes on said body for taking off electrical signals and for connection to the amplifier,
said body having a substantially constant cross section perpendicular to the compressive force,
said body polarized in a direction *d* in at least a sub-volume (*d* . *l* . *h*) thereof where *d* is the thickness dimension, *l* is the length dimension, and *h* is the height dimension,
said electrodes mounted on opposite surfaces of said body spaced apart the thickness *d*,
the thickness *d* perpendicular to the direction of the compressive force, the length *l* being perpendicular to the thickness *d* and to the direction of the compressive force and is greater than the thickness *d*, and the height *h* is perpendicular to the thickness *d* and the length *l* and is greater than 10*d*.

3,899,699
BRUSHLESS LINEAR DC MOTOR ACTUATOR

Brandt Mead Griffing, Delray Beach, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 316,645, Dec. 19, 1972. This application May 28, 1974, Ser. No. 474,123
Int. Cl.² H02K *41/00*
U.S. Cl. 310—13 **3 Claims**



1. A linear actuator comprising
a magnetic flux field source having two elongated surfaces with the magnetic flux field being produced perpendicular to said two surfaces,

a first bar of ferromagnetic material parallel to but spaced from said magnetic source surfaces for providing a low magnetic reluctance path therebetween,

a coil mounted around said first bar for permitting relative motion between said coil and said bar,

means movable with said coil and at least partially mounted within said coil for providing a low magnetic reluctance path between said first bar and one of said magnetic flux sources surfaces,

said means for providing a low reluctance path from within said coil being attached to said coil and being comprised of a center portion and two arms in a generally U-shaped configuration with said center portion passing through said coil and with the outer ends of said arms terminating in proximity to said one of said magnetic flux source surfaces, and

means for applying electrical energy to said coil,

whereby a moving force is applied to said coil in a direction determined by the polarity of the said electrical energy and the orientation of the magnetic field polarity from said source.

3,899,700

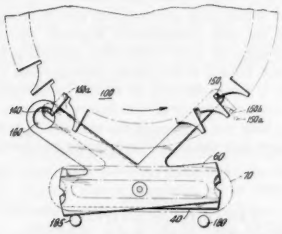
INDEXING MECHANISM FOR ELECTRIC WATCH

Paul Wuthrich, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Sept. 3, 1974, Ser. No. 503,142

Int. Cl.[2] H02K *33/00*

U.S. Cl. 310—37 **5 Claims**



1. An improved indexing mechanism for transforming oscillatory motion by electromagnetic motor means to unidirectional rotation of a toothed index wheel, wherein the improvement comprises:

first and second rotatable indexing members mounted on a common axis, each of said members having an index pin and adapted to be rotated together in the same direction by said motor means when it is active,

means providing limited relative rotation between said first and second members, and

means biasing said first and second members in opposite rotational directions such that their index pins are biased toward the index wheel when the motor means is inactive.

3,899,701

SMALL A.C. ELECTRIC MOTOR

Takashi Ogawa; Shunichi Sugiyama, and Kiyonori Kida, all of Kawasaki, Japan, assignors to Fuji Denki Seizo Kabushiki Kaisha, Japan

Filed Aug. 9, 1973, Ser. No. 387,036

Claims priority, application Japan, Sept. 29, 1972, 47-97821

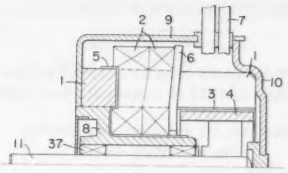
Int. Cl. H02k *1/12*

U.S. Cl. 310—40 MM **2 Claims**

1. A small A.C. electric motor which comprises:

a. a stator core in the form of a unitary block made of sintered soft magnetic material, said stator core having a disk-shaped yoke used as a common magnetic path and a plurality of tooth-like poles having winding-receiving slots formed therebetween, said poles extending from the periphery of said yoke in the axial direction thereof;

b. a plurality of individual windings each placed surrounding the tooth-like poles within corresponding winding-receiving slots from the axial direction of the stator core;



c. a rotor adjacent to said axially-extending tooth-like poles of the stator core; and

d. sleeve means made of soft magnetic material formed about the peripheral surfaces of said tooth-like poles between said poles and said rotor for alleviating higher spatial harmonics of magnetomotive force.

3,899,702

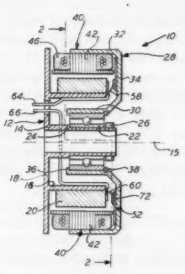
TORQUER ARMATURE

Samuel C. Hanna, Wyckoff, and Walter J. Krupick, Succasana, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Dec. 9, 1971, Ser. No. 206,465

Int. Cl. H02k *7/00*

U.S. Cl. 310—67 **4 Claims**



1. A D.C. torquer comprising:

a permanent magnet ring having a longitudinal axis and having a plurality of magnetized poles peripherally spaced about said axis,

a pair of brushes mounted on said magnetic ring;

a one-piece armature ring rotatable relative to said magnet ring about said axis and having a plurality of coils mounted thereon defining a corresponding plurality of coil-wound poles peripherally spaced about said axis, said armature ring having a plurality of slots disposed between said poles, said armature poles being separated from said magnet poles by a substantially constant gap; and

a commutator ring mounted on said armature ring and disposed coaxially with said armature ring and said magnet ring to be contacted by said brushes, wherein:

said armature ring has a ring-shaped web portion and a ring-shaped flange portion, said armature web portion and said armature flange portion having selected axial widths, said armature flange portion axial width being substantially greater than said armature web portion axial width; said magnet ring has a selected axial width substantially greater than said armature web portion axial width and approximately equal to said armature flange portion axial width; said armature flange portion has axially opposite projecting portions extending beyond said web portion and having respective axial widths of substantially

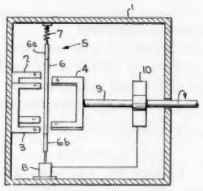
equal size, said axial width of each flange projecting portion being not greater than 0.4 times the overall armature flange portion axial width; each said armature coil has a coil portion projecting axially beyond the face of said armature web portion; and each said armature flange projecting portion extends axially beyond said armature coil portion disposed adjacent thereto.

3,899,703

PERMANENT MAGNET MOTION CONVERSION MEANS

Robert W. Kinnison, 1611 E. Lincoln St., Fort Collins, Colo. 80521

Filed May 10, 1974, Ser. No. 468,978
Int. Cl.[2] H02K *49/10*
U.S. Cl. 310—103 7 Claims



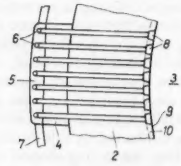
1. A magnetic motor having at least one magnetic drive unit, the drive unit comprising: first and second stationary magnets arranged with inverse directions of polarity; a movable magnet mounted for rotation within the magnetic fields of said first and second stationary magnets, said movable magnet being mounted about an axial member so as to enable its direction of polarity to be inversed as said movable magnet rotates; diverter means for alternately diverting the magnetic fields of said first and second stationary magnets for preventing such magnetic fields from influencing said movable magnet so as to enable only said stationary magnet having its direction of polarity in opposition with the polarity of said movable magnet to influence said movable magnet by creating a repulsion force between said magnets and thereby causing the movement of said movable magnet.

3,899,704

STARTER OR DAMPER WINDING ARRANGEMENT FOR A SYNCHRONOUS ELECTRICAL MACHINE

Werner Leistner, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 5, 1974, Ser. No. 448,299
Claims priority, application Germany, Mar. 7, 1973, 2311945
Int. Cl. H02k *3/11*
U.S. Cl. 310—183 5 Claims



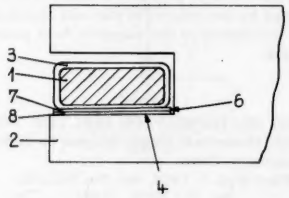
1. In an electrical synchronous machine such as of the vertical type or the like having a rotor equipped with laminated poles, an arrangement for a winding suitable as a starter winding, a damper winding or a starter-damper winding comprising: a first shorting ring, a plurality of insulated resistors, a body of ferromagnetic material forming part of the rotor and having slots for accommodating said insulated resistors therein, a plurality of insulated winding bars mounted on at least one of the poles, one end of each of said bars being connected to said first shorting ring and the other end of each of said bars being connected to a corresponding one of said resistors at one end thereof, and a second shorting ring connected to the other end of each one of said resistors.

3,899,705

SHRINK-RING COMMUTATOR SEGMENT ASSEMBLY

Werner Heil, Birr, Switzerland, assignor to BBC Aktiengesellschaft Brown Boveri & Cie., Baden, Switzerland

Continuation of Ser. No. 253,132, May 15, 1972, abandoned.
This application May 17, 1973, Ser. No. 361,224
Claims priority, application Switzerland, June 3, 1971, 8098/71
Int. Cl. H01r *39/16*
U.S. Cl. 310—235 3 Claims



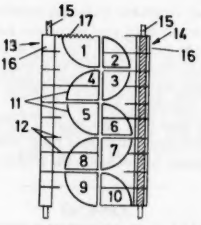
1. An electrical commutator component of a dynamoelectric machine comprising a cylindrical assembly of commutator segments, and shrink-ring surrounding and exerting a compressive force on said commutator segment assembly, the entire surface area of said shrink-ring including insulation material thereon having a maximum thickness not exceeding approximately 0.5 mm thereby to render it substantially incompressible and consisting of two layers, the inner layer in actual contact with the surface of the shrink-ring being mica-containing paper and the outer layer being polyimide.

3,899,706

PARTICLE MULTIPLIERS

Geoffrey William Ball, Apple Patch, Bellingdon, Chesham Buckinghamshire, England

Filed Dec. 29, 1972, Ser. No. 319,702
Int. Cl. H01j *43/10*
U.S. Cl. 313—105 8 Claims



1. In a particle multiplier having a plurality of dynodes generally arranged in a first direction, a plurality of serially connected resistive elements, and means for electrically connecting successive ones of the dynodes to the junctions of successive ones of the resistive elements, the improvement wherein (A) the resistive elements comprise a stack of spacers successively arranged in the first direction and formed from insulating material, the opposed ends of each spacer in the first direction being provided with a conductive layer, the side of each spacer between the conductively coated ends being provided with a resistive layer interconnecting the conductive layers on the ends to form a resistive body, and wherein (B)

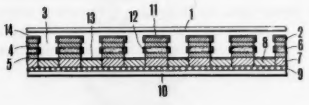
the connecting means position each dynode between and in contact with the conductive layers on the opposed ends of a separate pair of adjacent spacers.

3,899,707

COLD CATHODE DISCHARGE TYPE DISPLAY DEVICE

Rentaro Sasaki; Akinori Watanabe, both of Takasaki; Mamoru Ikegame, Tachikawa, and Tatsuo Ogasawara, Tokyo, all of Japan, assignors to Oki Electric Industry Co., Ltd. and Okaya Electric Industry Co., Ltd., both of Tokyo, Japan

Filed Oct. 26, 1973, Ser. No. 409,851
Claims priority, application Japan, Nov. 1, 1972, 47-125411
Int. Cl. H01j *61/54*
U.S. Cl. 313—197 2 Claims



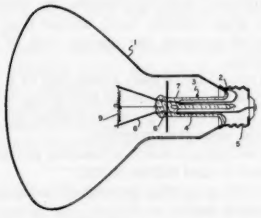
1. In a cold cathode discharge type display device of the type wherein a cathode substrate, a starting electrode substrate and an anode substrate are laminated between upper and lower insulative substrates with said starting electrode substrate between said cathode and anode substrates, said cathode substrate, starting electrode substrate and anode substrate are provided with a plurality of sets of aligned perforations which are arranged in a plurality of matrixes, and said perforations act as discharge cells, the improvement which comprises spacing means for one of said insulative substrates for forming a deionization gap area over said matrixes contiguous with said discharge cells.

3,899,708

NOISE FREE INCANDESCENT LAMP

Alexander Tartakoff, Beverly; John J. Gutta, Salem, and Robert M. Griffin, South Hamilton, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Apr. 10, 1974, Ser. No. 459,528
Int. Cl. H01k
U.S. Cl. 313—315 4 Claims



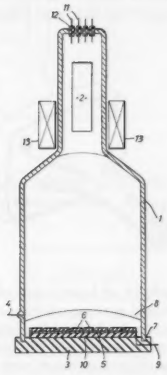
1. In an incandescent lamp for use with a solid-state dimmer of the type that can induce noisy physical vibrations in lamp magnetic lead-in wires, said lamp including a gas filled glass envelope sealed at its lower end to the flare of a stem press glass mount and a metal base attached to the lower end of the envelope, the improvement comprising two outer lead-in wires connected to said base and extending to said stem press where they are connected to intermediate wires embedded in said stem press where they are connected to intermediate wires embedded in said stem press; two inner lead-in wires connected to said intermediate wires and extending inwardly in said envelope, said inner and outer lead-in wires being made of nonmagnetic metal; and a coiled tungsten filament connected to and supported by said inner lead-in wires.

3,899,709

CATHODE RAY TUBE ACOUSTIC TRANSDUCERS

Patrick Harold Brown, Hillingdon, and Raymond Frank Sivyer, Sunbury-on-Thames, both of England, assignors to EMI Limited, Hayes, England

Filed June 13, 1974, Ser. No. 479,128
Claims priority, application United Kingdom, Sept. 4, 1973, 41512/73
Int. Cl.[2] H01J *31/495*
U.S. Cl. 313—369 7 Claims



1. A cathode ray tube acoustic transducer including,
a. an evacuated envelope,
b. a faceplate of acoustically transmissive material sealed to said envelope,
c. a piezo-electric transducing layer supported by said faceplate within said envelope and sensitive to spatial variations of pressure applied thereto,
d. an electron gun mounted within said envelope for providing a beam of electrons directed toward said transducing layer,
e. means for scanning said beam,
f. signal electrode means for deriving electrical output signals from said transducing layer indicative of the spatial variations of pressure applied thereto and
g. an acoustically transmissive layer of resilient material separating and in contact with said faceplate and said transducing layer for maintaining the resonant frequency of said transducing layer.

3,899,710

COLOR CATHODE RAY TUBE WITH TEMPERATURE-RESPONSIVE COLOR PURITY MAGNETS

Hiromasa Machida, Tokyo, and Noboru Yamaguchi, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

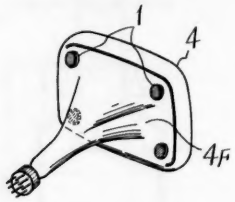
Filed Feb. 2, 1973, Ser. No. 329,049
Claims priority, application Japan, Feb. 3, 1972, 47-14377
Int. Cl.[2] H01J *29/07, 29/51*
U.S. Cl. 313—412 4 Claims

1. A color cathode ray tube arrangement comprising:
A. a color cathode ray tube comprising:
1. a color phosphor screen comprising areas arranged in a predetermined pattern to emit light of different colors when struck by electrons,
2. electron beam generating means to direct electron beams at said screen, and
3. a beam selecting element disposed near said screen comprising electron passages positioned relative to said areas to allow said electron beams to land on predetermined areas of said screen according to the directions

along which said beams pass through said passages; and

B. temperature responsive magnetic means provided on said tube for compensating for mislanding of said electron beams on incorrect ones of said areas of said screen due to thermal expansion of said beam selecting element resulting in displacement of at least some of said passages relative to their respective areas of said screen, said temperature responsive magnetic means comprising:

1. a permanent magnet, and
2. a magnetic shunt element having temperature responsive variable permeability, said magnetic shunt element



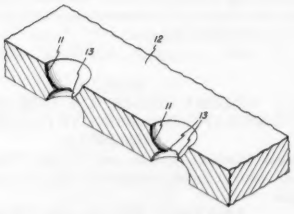
forming a path for at least a part of the magnetic flux originating in said permanent magnet and being located on said tube to be heated by heat from said beam selecting element to change the intensity of magnetic flux from said magnetic means with temperature variations in said tube to cause the path of said electron beams landing on the screen to change in response to said thermal expansion of the beam selecting element thereby to maintain excellent color purity of light emitted by said screen, said magnetic element being formed into a block-like shape having a recess on one surface, and said permanent magnet being placed in said recess.

3,899,711

LAMINATED MULTI-APERTURED ELECTRODE

Charles Q. Lemmond, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 9, 1973, Ser. No. 358,735
Int. Cl.[2] H01J *29/07, 29/02, 29/62*
U.S. Cl. 313—458 **5 Claims**



1. An electron optical lens comprising:

a conductive support plate having an array of apertures therein;

a pair of lens plates, each having the same number of apertures therein as said support plate and in the same pattern;

said support plate positioned between said lens plates and bonded thereto with said apertures in substantial alignment;

the apertures in said support plate being larger than the apertures in said lens plates whereby the electron optical characteristics of said lens are determined solely by the size and shape of the apertures in said lens plates;

said apertures characterized by a generally circular shape, the apertures of said lens plates having a diameter of up to 30 mils and a center to center spacing of up to 60 mils.

3,899,712

TAPERED HELICAL COMPACT FLUORESCENT LAMP

Harald L. Witting, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 1, 1974, Ser. No. 465,901
Int. Cl.[2] H01J *17/34, 61/33*
U.S. Cl. 313—493 **1 Claim**

1. An electric discharge lamp comprising:

an evacuable envelope including inner and outer glass members of tapered cylindrical shape in nested coaxial relationship, at least one of said members having a helically-shaped channel therein for providing an electrical discharge path; said channel characterized by a non-uniform pitch around the circumference of said cylindrical member wherein the helix angle of said channel is a minimum where the channel crosses a vertical plane passing through said envelope and is a maximum at 90° to said plane, thereby providing an asymmetric helically-shaped channel;

a pair of electrodes, one disposed adjacent each end of said channel and supported by at least one of said glass members;

a luminescent material covering the interior walls of said glass members at least along said discharge path, the luminescent material covering the interior wall of said inner glass member being thicker than the luminescent material covering the interior wall of said outer glass member;

ballast means electrically connected to said electrodes for regulating electric current flow along said discharge path, said ballast means positioned within the opening defined by said inner glass member;

means including a screw-in base for providing said electric current to said ballast means;

means sealing together the ends of said inner and outer glass members; and

a gaseous filling in said discharge path.

3,899,713

TOUCH LAMP, LATCHING AC SOLID STATE TOUCH SWITCH USABLE WITH SUCH LAMP, AND CIRCUITS FOR THE SAME

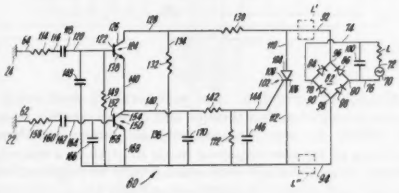
Harold Barkan, Ardsley, N.Y.; George E. Brayman, Stamford, Conn., and Jerome Swartz, Stony Brook, N.Y., assignors to Hall-Barkan Instruments, Inc., Tuckahoe, N.Y.

Continuation of Ser. No. 215,863, Jan. 6, 1972, abandoned.
This application June 20, 1974, Ser. No. 481,304
Int. Cl.[2] H05B *41/16*
U.S. Cl. 315—34 **8 Claims**

1. In combination,

A. an electrically actuatable load,

B. an on touch element having no parts which are movable as a requisite to the actuation of the load,
C. an off touch element having no parts which are movable as a requisite to the deactuation of the load, and
D. totally solid state circuitry means to energize said load upon touching said on touch element and to de-energize said load upon touching said off touch element,
E. said solid state circuitry means being engageable with so as to be energizeable by an AC source of power, said solid state circuitry means including
i. input terminals connectable to said AC source of power,
ii. a power handling solid state switch having
a. a cathode terminal,
b. an anode terminal and
c. a control terminal,
iii. means connecting said cathode and anode terminals through the load to said input terminals,
iv. a solid state amplifier means having



a. input means and
b. output means,
v. means connecting the amplifier input means to the touch elements,
vi. means connecting the amplifier output means to the control terminal of a solid state switch whereby when said on touch element is touched the solid state switch is placed in a conductive mode and the load thereby is energized,
vii. capacitor means between the cathode and control terminals,
a. said capacitor means being of such value that upon energization of the solid state switch it will be charged sufficiently to latch the solid state switch in conductive mode after the same is placed in such mode, and
viii. circuit means connected to the output means of the solid state amplifier means and activated by contacting the off touch element after the load is energized for discharging the capacitor means so as to disable the latching means and thereby return the solid state switch to a non-conductive mode so as to de-energize the load.

3,899,714

QUICK STARTING MAGNETRON WITH SHIELDED CATHODE

Maurice Esterson, and Francis James Weaver, both of Chelmsford, England, assignors to English Electric Valve Company Limited, Chelmsford, England

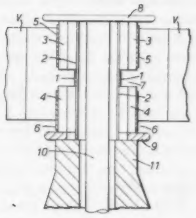
Filed Dec. 13, 1973, Ser. No. 424,358

Claims priority, application United Kingdom, Dec. 21, 1973, 59136/73

Int. Cl. H01j *25/50*

U.S. Cl. 315—39.51 **10 Claims**

1. A quick starting magnetron including an anode; a first thermally emissive cathode structure of low heat inertia; and a second cathode structure of relatively high heat inertia positioned between said anode and said first cathode structure; a continuous circumferential aperture provided in said second cathode so that said second cathode is formed in two axially separated portions, the aperture permitting electrons to pass therethrough from said first cathode structure into the space between the anode and the second cathode structure; said second cathode structure being positioned and dimensioned so as to at least partially screen the first cathode structure from electron bombardment during normal running of the magnetron.



3,899,715

MAGNETRON WITH ROTATABLE TUNING MEANS

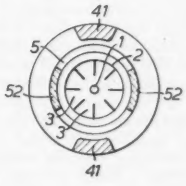
Maurice Esteron, and Robert Bernard Coulson, both of Chelmsford, England, assignors to English Electric Valve Company Limited, Chelmsford, England

Continuation of Ser. No. 371,684, June 20, 1973, abandoned. This application Sept. 20, 1974, Ser. No. 507,594

Claims priority, application United Kingdom, June 22, 1972, 29227/72

Int. Cl.² H01J *25/50*

U.S. Cl. 315—39.61 **18 Claims**

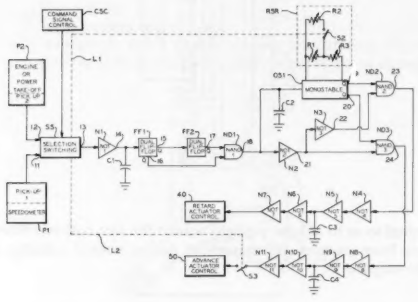


1. A tunable coaxial magnetron comprising in combination:
a cathode member;
an anode member defining a plurality of radially disposed cavity resonators disposed adjacent to said cathode member and presenting an outer cylindrical wall surface;
an outer wall member surrounding said anode member and presenting an inner cylindrical wall surface defining with said outer cylindrical wall surface an annular resonant main cavity disposed coaxially with respect to said anode member and along the annular path of which an electric field is generated;
means for producing at least one region of locally intensified electric field along the annular path of said main cavity, said means comprising at least one conductive projection on one of said wall surfaces, such projection extending radially toward the other wall surface whereby locally to reduce the radial cross section presented to the electric field; and
a rotary tuning member including at least one dielectric member within said main cavity and means for rotating said tuning member to cause the dielectric member to move periodically through said region of locally intensified electric field to effect cyclic variation of tuning.

3,899,716
CONDITION SENSING AND CONTROL APPARATUS

David C. Kaminski, 5715 Centerview Dr., Sylvania, Ohio 43560

Filed Sept. 27, 1973, Ser. No. 401,371
Int. Cl. G01p 3/58
U.S. Cl. 317—5 23 Claims



1. Digital condition sensing and control apparatus comprising

a. means for sensing the condition of a variable and providing an actual condition signal in which said signal has a time duration related in magnitude to the actual condition of the variable,

b. means responsive to said sensing means for generating a reference signal which is initiated at the same time as said actual condition signal, said reference signal having a time duration related in magnitude to a desired condition for said variable,

c. first logic circuit means including means for providing a complementary signal of said reference signal and for further providing a first output signal in response to a coincidence of said actual condition signal and said reference complementary signal to indicate a deviation of said variable in a first direction from said desired condition for said variable, said first output signal having a time duration related in magnitude to the difference between the actual condition and the desired condition, and

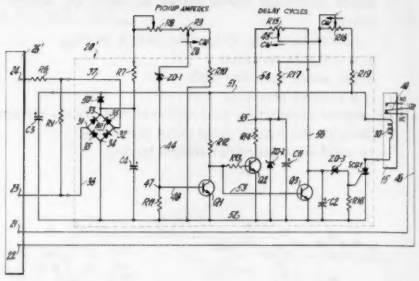
d. second logic circuit means including means for providing a complementary signal of said actual condition signal and for further providing a second output signal in response to a coincidence of said reference signal and said complementary actual condition signal to indicate a deviation of said variable in a second direction from said desired condition for said variable, said second output signal having a time duration related in magnitude to the difference between the actual condition and the desired condition.

3,899,717
GROUND FAULT DETECTORS

Raymond H. Legatti, Belleair; Charles M. Clinton, Safety Harbor, and Charles W. Draper, Clearwater, all of Fla., assignors to Electromagnetic Industries, Inc., Fla.

Filed July 16, 1973, Ser. No. 379,263
Int. Cl. H02h 3/28
U.S. Cl. 317—18 D 10 Claims

1. A ground fault detector, for protecting electrical equipment from destructive arcing ground faults by opening service disconnect equipment, having a control winding, in the circuit to be protected, said ground fault detector comprising, in combination, a current transformer having a primary winding through which conductors of the protected circuit are adapted to pass, and having a secondary winding; a rectifier bridge having input terminals connected to said secondary winding and having output terminals; a storage capacitor connected directly across said bridge output terminals for direct charging solely by a rectified fault current; a voltage divider connected across said output terminals and said capacitor and monitoring the voltage across said capacitor; a normally open switch connected in a series circuit including said capacitor and a control winding of said service disconnect equipment; and a voltage responsive device connected to said voltage divider and connected in controlling relation with said normally open swtich, and operable, responsive to the voltage across said capacitor, as monitored by said voltage divider, attaining a preselected magnitude due to charging of said capacitor by a

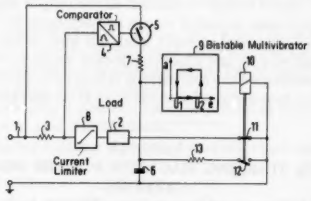


rectified fault current, to close said normally open switch to discharge said capacitor through said control winding to open said service disconnect equipment; said current transformer operating in the zero sequence mode to produce a secondary winding output voltage proportional only to a ground fault current; said current transformer and said storage capacitor being of sufficient capacity respectively, as associated herein, to operatively power said ground fault detector in response to a ground fault in the protected circuit sensed by said current transformer alone.

3,899,718
METHOD AND ARRANGEMENT FOR LIMITING THE POWER DISSIPATED IN ELECTRONIC COMPONENTS

Ulrich Schafe, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 28, 1974, Ser. No. 437,228
Claims priority, application Germany, Feb. 7, 1973, 2306013
Int. Cl. H02h 7/20
U.S. Cl. 317—33 R 7 Claims



1. Apparatus for limiting the power dissipation of an electronic component coupled to a power source in the case of excessive load current comprising:

a. means to detect a load current exceeding a predetermined threshold value and to provide a first output signal indicative thereof;

b. means responsive to said first output signal to provide, after a first predetermined first time delay, a second output signal;

c. said means further adapted to remove said output signal after a second predetermined time interval;

d. means arranged between said power source and said electronic component responsive to said second output

signal for interrupting the load current supplied to said component when said second output signal is present; and e. means interposed between said power source and said component to limit the maximum current flowing during said first predetermined time interval.

3,899,719

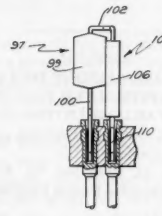
INTEGRATED CIRCUIT PANEL AND DUAL IN-LINE PACKAGE FOR USE THEREWITH

James V. Murphy, Warwick, R.I., assignor to Electronic Molding Corporation, Woonsocket, R.I.

Filed Aug. 30, 1973, Ser. No. 393,214

Int. Cl. H05k *1/04*

U.S. Cl. 317—101 CC **6 Claims**



1. An integrated circuit panel assembly comprising, a panel board having a plurality of female terminals secured in a predetermined pattern therein, and a plurality of dual in-line integrated circuit packages mounted on said panel board, each of said integrated circuit packages including a body portion, the vertical dimension of which is greater than the horizontal dimension thereof in the normal position of use thereof as mounted on said panel, a plurality of integrated circuits embedded in said body portion, and a plurality of leads electrically interconnected to said embedded integrated circuits and projecting outwardly of said body portion, a first set of said leads being located in the bottom of said body portion and projecting downwardly therefrom in the position of use of said package and extending into corresponding aligned female terminals located in said panel, a second set of said leads being located in opposed relation to said first set at the top of said body portion, the leads of said second set being bent to depend downwardly in parallel and close adjacent relation to said first set in the position of use of said package and electrically communicating with corresponding aligned female terminals located in said integrated circuit panels, the leads of one set being vertically foreshortened, and an adapter being interconnected to each of the foreshortened leads and being receivable in a terminal.

3,899,720

PACKAGE FOR MICROWAVE INTEGRATED CIRCUITS

Noel C. Peterson, Severna Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 14, 1973, Ser. No. 397,486

Int. Cl.² H02B *1/00*

U.S. Cl. 317—101 D **15 Claims**

1. An hermetically sealed flat package housing a microwave circuit board comprising:

a thin, planar base of dielectric material having a metal layer on a central portion of a first planar surface thereof;

a thin planar spacer of dielectric material having a peripheral shape generally corresponding to said planar base and having a central portion and first and second terminal end portions extending from said central portion,

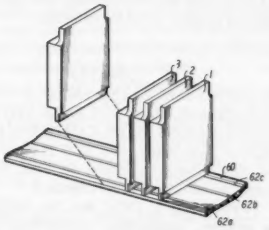
said central portion having a cut-out extending between the said first planar surface and the opposite, second planar surface of said spacer for exposing said metal layer of said planar base through said cut-out,

said first terminal end portion extending outwardly from said base and including on said second planar surface a first plurality of electrically conductive metal film connector leads extending from the cut-out of said central portion to the outer edge of said first terminal end portion and at least one metal film on said first planar surface disposed to underlie and provide a ground plane for each of said first plurality of metal film connector leads whereby each of said metal film connector leads of said first terminal end portion comprises a microstrip transmission line, and

said second end portion of said spacer having a second plurality of electrically conductive metal film leads thereon extending from said cut-out to an outer edge of said second terminal end portion;

said spacer being bonded on a first planar surface thereof to said first planar surface of said base, with said cut-out of said central portion aligned with said metal layer of said base and with said metal film of said first planar surface of said first terminal end portion in mechanical and electrical contact with said metal layer of said base;

a planar frame having a thickness substantially greater than that of said spacer and having a cut-out larger than said



cut-out of said spacer, said planar frame being bonded to said spacer with the respective cut-outs thereof in alignment exposing within said cut-out of said frame, portions of said first and second pluralities of said connector leads adjacent said cut-out of said planar spacer;

a circuit board received within said cut-outs of said planar frame and of said planar spacer and mounted on said metal layer of said planar base, said circuit board having a first plurality of microstrip connector leads thereon and a second plurality of low frequency connector leads thereon, said first plurality of connector leads of said first terminal end portion being connected to said first plurality of microstrip connector leads of said circuit board and said second plurality of connector leads of said second terminal end portion being connected to said second plurality of low frequency connector leads of said circuit board at the said portions thereof adjacent the cut-out of said central portion as exposed within said cut-out of said frame, and

a planar metal top plate having a peripheral shape generally corresponding to said planar frame and bonded thereto hermetically sealing said circuit board within said package.

3,899,721

PRINTED CIRCUIT CARD GUIDE

Edwin Harley Borchard, Brielle, N.J., and Karl-Heinz Pohl, Boulder, Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

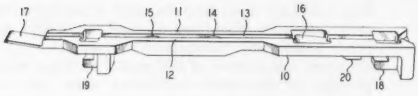
Filed Mar. 20, 1974, Ser. No. 452,931

Int. Cl.² H02B *1/02*

U.S. Cl. 317—101 DH **7 Claims**

1. An elongated resilient guide member having a longitudinal channel extending therethrough said channel being defined by:

a pair of substantially parallel side walls and a floor, said side walls being disposed to receive between them the opposite faces of a printed circuit card and said floor being disposed to receive a non-facial edge of said circuit card,



at least a pair of nodes disposed in said channel floor, said nodes being positioned to interfer ingly engage said non-facial edge of said circuit card, and

at least one cantilever element having a fixed end integral with said channel floor and a free end extending away from said channel floor for interferingly engaging said non-facial edge, said node and said cantilever element exerting a pressure at various points of contact along said non-facial edge for constraining said circuit card against rotational motion in its facial plane.

3,899,722

PLASTICS-INSULATED SWITCH UNIT FOR MULTI-PHASE HIGH-VOLTAGE SWITCHGEAR INSTALLATIONS WITH EARTHING CONTACT

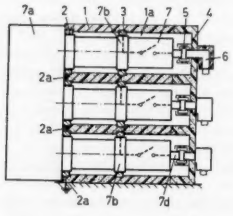
August Cadez, Wettingen, and Rolf Schaumann, Wurenlos, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed July 1, 1974, Ser. No. 484,856

Claims priority, application Switzerland, July 12, 1973, 10207/73

Int. Cl. H02b *11/04;* **H01h** *31/04*

U.S. Cl. 317—103 **6 Claims**



1. A plastics-insulated switch unit in a multi-phase high-voltage switchgear installation comprising a frame made from a plastic material and including parallel spaced cylindrical recesses for the respective phases, each said recess being provided with at least two longitudinally spaced internal ring-shaped contact pieces, and plug-in type cylindrical switching modules correlated to said phases and recesses and each of which includes at least one external ring-shaped counter contact piece and which is alternatively engaged with one or the other of said internal ring-shaped contact pieces dependent upon whether the switching module is plugged into the recess or withdrawn therefrom, one of said ring-shaped contact pieces in each recess being earthed and providing an earth connection for the correspondingly positioned ring-shaped contact piece on the switching module when in the withdrawn position.

3,899,723

CATHODE FOIL FOR ELECTROLYTIC CONDENSERS

Martin Mühlhäusser, Hohentwie, and Christian Roth, Gottmadingen, both of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation of Ser. No. 219,112, Jan. 19, 1972, abandoned. This application Nov. 26, 1973, Ser. No. 419,146

Claims priority, application Germany, Jan. 21, 1971, 2102702

Int. Cl.[2] H01G *9/00;* **C22C** *21/00*

U.S. Cl. 317—230 **2 Claims**

1. In an electrolytic condenser, a foil strip cathode electrode comprising an alloy of 0.2 to 2.0 percent by weight of manganese and the balance of the alloy being commercially pure aluminum having a purity of from 99.0 to 99.8 percent by weight, said electrode having a thickness from 0.0043 to 0.1520 millimeters.

3,899,724

SETTING UP MACHINE INCLUDING COMPUTER-CONTROLLED POSITIONER FOR MACHINE PART ADJUSTING ELEMENT

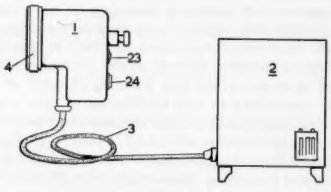
Peter Malcolm Colton, Leicester, England, assignor to Wadkin Limited, Leicester, England

Filed May 24, 1973, Ser. No. 363,554

Claims priority, application United Kingdom, May 26, 1972, 24850/72

Int. Cl. B23q *17/18, 3/18*

U.S. Cl. 318—162 **7 Claims**



1. A setting up unit for machinery comprising a transportable positioner for machine part adjusting elements, means for connecting the positioner to individual adjusting elements in turn, a computer for controlling the operation of the positioner to shift a machine part adjusting element connected to the positioner from one predetermined setting to another and means for identifying the machine part adjusting element to which the positioner at any time is connected and conveying that information to the computer.

3,899,725

BRAKING EFFORT CONTROL

Allan B. Plunkett, Lawrence Park, Pa., assignor to General Electric Company, Erie, Pa.

Filed Feb. 25, 1974, Ser. No. 436,341

Int. Cl. H02p *5/40*

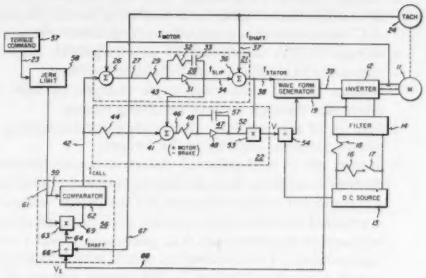
U.S. Cl. 318—227 **21 Claims**

1. An improved control circuit for an inverter which is suitable for interconnecting a d-c power source and an a-c motor load, the a-c motor being adapted to deliver power to the inverter during periods of electrical braking and the inverter being operative in a square wave mode when the speed of said motor is above a predetermined value, wherein the improvement comprises:

a. means for generating a current command signal representative of the desired motor current;

b. means for modulating said current command signal in response both to the motor speed and to changes in the motor voltage; and

c. means responsive to the modulated command signal for controlling the operation of said inverter so as to control



the motor current during periods of electrical braking and to maintain a constant torque output whenever the motor speed is above said predetermined value.

3,899,726

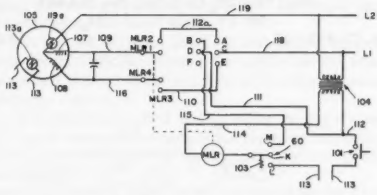
AUTOMATIC REVERSING CONTROL EQUIPMENT

John W. Ellmore, West Chester, Pa., assignor to Allister Manufacturing Company, Inc., Exton, Pa.

Continuation-in-part of Ser. No. 393,283, Aug. 31, 1973, Pat. No. 3,813,590. This application May 17, 1974, Ser. No. 470,760

Int. Cl. H02h *7/06*

U.S. Cl. 318—472 **7 Claims**



1. A drive system including a reversible motor for driving an element between limit positions, and a control circuit for the motor comprising

a power supply circuit for supplying power to the motor, a switch means in the supply circuit for controlling the supply of power to the motor, a control circuit for controlling the switch means, the control circuit including an actuating switch for controlling the operation of the switch means, a first thermal switch which opens in response to an increase in the operating temperature of the motor above a first predetermined temperature for disabling the actuating switch, and a second thermal switch which opens in response to an increase in operating temperature of the motor above the first predetermined temperature for interrupting the supply of power to the motor.

3,899,727

PLURAL MOTOR CONTROL SYSTEM FOR CONTROL ROD DRIVE MECHANISMS

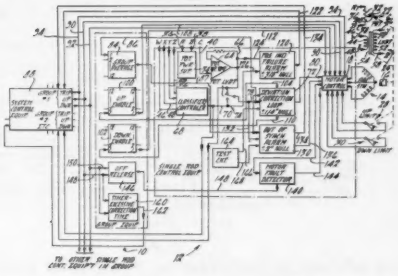
John R. Thayer, Lancaster, Ohio, assignor to Diamond Power Specialty Corporation, Lancaster, Ohio

Continuation of Ser. No. 746,578, July 22, 1968, abandoned. This application Sept. 8, 1971, Ser. No. 178,844

Int. Cl. G05b *9/02*

U.S. Cl. 318—564 **17 Claims**

1. A system for positioning a plurality of drive mechanisms to a preselected reference position comprising a plurality of drive mechanisms having an individual load for each drive mechanism to be driven by each mechanism, sensing means operatively associated with each drive mechanism for sensing the position of each drive mechanism and, thus, the associated load, including single drive signal means for generating a position signal for each drive mechanism, single reference signal generating means responsive to said sensing means for generating a single reference signal which is common to all



said drive mechanisms which is an average of the positions of all the drive mechanisms, and output signal means associated with each drive mechanism responsive to both said reference signal and at least one position signal for energizing selected ones of the drive mechanisms in response to a deviation of said position signal and said reference signal.

3,899,728

APPARATUS FOR MAINTAINING HIGH PRECISION IN A ROTATING DEVICE USED WITH OPTICAL APPARATUS

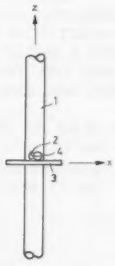
Walter Hoppe, Munich, Germany, assignor to Max-Planck-Gesellschaft ZUR Forderung der Wissenshaften e.V., Gottingen, Germany

Filed July 12, 1973, Ser. No. 378,421

Claims priority, application Germany, July 21, 1972, 2236529

Int. Cl. G05b *11/00, 1/06*

U.S. Cl. 318—687 **7 Claims**



1. In a charged particle beam optical apparatus, the combination comprising:

a frame;

at least one support bearing mounted in said frame;

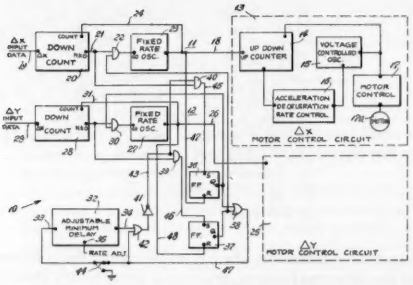
a tilting device, including an elongated shaft rotatably mounted in said bearing for supporting a specimen and rotating said specimen about a specified axis of rotation; means, disposed adjacent and coupled to said tilting device, for measuring linear movement of said tilting device in at least one direction with respect to said beam; means, coupled to said frame, for movably supporting said tilting device for movement in at least said one direction; and

means, coupled to said measuring means and said support means, for determining the position of said tilting device and axis of rotation and adjusting the position thereof by means of said support means with respect to said particle beam.

3,899,729
MAXIMUM SPEED CONTROL CIRCUIT FOR A STEPPING MOTOR

Arthur Richard Emery, Bristol, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Jan. 16, 1974, Ser. No. 433,873
Int. Cl. G05b *19/40*
U.S. Cl. 318—696 **8 Claims**

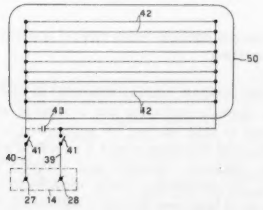


1. A speed control circuit having an input, said motor control means including a variable rate oscillator means for setting the rate at which the changes of energization occur and having a maximum rate, said speed control circuit including a fixed rate oscillator and an adjustable delay means, means setting said fixed rate oscillator to produce pulses at a fixed rate no greater than the maximum rate of the variable rate oscillator means and means interconnecting the adjustable delay means to the fixed rate oscillator to regulate a lesser rate of the pulses produced by the fixed rate oscillator than that to which it is set whereby said motor is prevented from normally stepping at a rate greater than the maximum rate set by the pulses from the speed control circuit.

3,899,730
METHOD OF ELIMINATING RISK OF DISCHARGE OF A BATTERY IN AN ELECTRICAL INSTALLATION FOR A MOTOR VEHICLE AND AN APPARATUS FOR EFFECTING THE SAME

Aldo Volontieri, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 205,536, Dec. 7, 1971. This application June 20, 1974, Ser. No. 481,472
Claims priority, application Italy, Dec. 12, 1970, 32944/70
Int. Cl. B60l *1/02*
U.S. Cl. 320—61 **1 Claim**



1. In an electrical installation for a motor vehicle powered by an internal combustion engine which permits the connection thereto of selected electrical-power consuming devices of the vehicle operated directly from a constant and regulated alternating current supplied from an A.C. alternator, the improvement comprising, in combination:

an A.C. alternator driven by the engine and having a controllable D.C. field excitation winding;

a voltage regulator associated with said controllable D.C. field excitation winding for maintaining the output of said A.C. alternator at a constant and regulated voltage;

a storage battery connected to be charged by said A.C. alternator at a constant and regulated voltage;

a storage battery connected to be charged by said A.C. alternator through current rectifying means;

a first set of said selected electrical-power consuming devices connected directly to the battery;

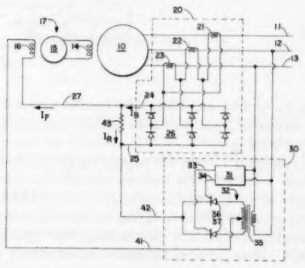
a second set of said selected electrical-power consuming devices comprising heat generating resistors embedded in a transparent window material for the motor vehicle and connected directly to the constant and regulated alternating current supplied from A.C. generator, thereby effecting operation of said second set of said selected electrical-power consuming devices by the output voltage of said A.C. alternator which is regulated and held constant irrespective of the speed of said A.C. alternator and thereby elmininating the risk of discharge of said battery by reducing the number of selected electrical-power consuming devices connected to said battery; and

wherein capacitors coupled in parallel with said resistors are provided for correcting the power factor.

3,899,731
VOLTAGE REGULATOR WITH CONTROLLED CURRENT

Forest D. Smith, St. Louis Park, Minn., assignor to Electric Machinery Mfg. Company, Minneapolis, Minn.

Filed May 29, 1973, Ser. No. 364,865
Int. Cl. H02p *9/10, 9/14*
U.S. Cl. 322—25 **10 Claims**



1. A voltage regulating system for a generator having field energizing means, comprising:

a. voltage responsive means connected to the output of the generator, for producing field energizing control signals in response thereto to maintain the output voltage of the generator at a predetermined level, said voltage reference means including a full converter output circuit;

b. current responsive means associated with the output of the generator for producing boost signals in response to the current output of the generator;

c. means connecting said full converter output circuit and said current sensing means in series circuit with said field energizing means of said generator;

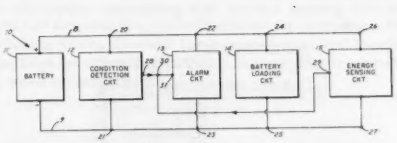
d. load means connected to said current sensing means; and

e. said voltage responsive means operable in response to excessive boost signals to adjust said control signals to divert the excessive boost signals through said load means, thereby preventing loss of regulator control.

3,899,732
METHOD AND APPARATUS FOR MONITORING BATTERY ENERGY LEVEL

Paul A. Staby, Lakewood, Colo., assignor to Statitrol Corporation, Lakewood, Colo.

Filed Aug. 16, 1973, Ser. No. 388,975
Int. Cl. G01n 27/42; G08b 21/00
U.S. Cl. 324—29.5 15 Claims



1. Battery operated detection apparatus comprising:

first and second electrical lead means for connection, respectively, to the positive and negative terminals of a battery power source;

battery powered means for sensing a selected condition and generating a first electrical output signal representative of said condition, said sensing means being connected between said electrical lead means to receive power therefrom whereby to be powered by the battery power source connected thereto;

battery powered alarm means connected between said first and second electrical leads to receive power therefrom whereby to be powered by the battery power source connected thereto, said alarm means being connected to said sensing means to receive said first electrical output signal and being operable to generate an output signal corresponding thereto;

means connected between said first and second electrical leads for periodically loading the battery power source connected thereto to subject it to momentary increased discharge current;

means for generating a first voltage signal having a magnitude equal to a selected proportion less than 100 percent of the output voltage of the battery power source prior to said loading;

means for generating a second voltage signal having a magnitude less than said first voltage signal and equal to the output voltage of the battery power source when loaded less a predetermined voltage drop; and,

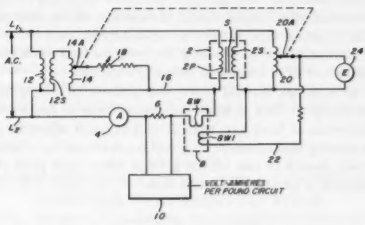
means for comparing said first and second voltage signals and generating a second electrical output whenever their difference exceeds a predetermined magnitude, said difference only exceeding a predetermined magnitude whenever the energy stored in the battery power source is below a selected energy level, and alarm means being connected to receive said second output signal and being operable to generate an output signal corresponding thereto.

3,899,733
APPARATUS FOR COMPENSATING FOR INSTRUMENTATION LOSS

Merlin L. Osborn, Saxonburg; Layton D. Crytzer, Natrona Heights, and Donald M. Stewart, Tarentum, all of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Mar. 4, 1974, Ser. No. 447,801
Int. Cl. G01r 33/00
U.S. Cl. 324—34 R 7 Claims

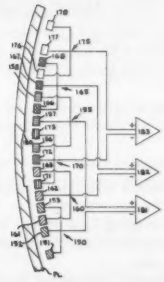
1. A measuring apparatus with means for compensating the measurement for instrumentation loss comprising a load, a power source, an isolation transformer having its primary connected across said power source, a first lead from a first side of said power source to the first side of said load, a second lead from a second side of said power source to the second side of said load, at least one instrument connected in said second lead, a third lead from one side of the secondary of said isolation transformer to said second side of said power source, a first ratio transformer, one side of said ratio transformer connected to the other side of the secondary of said isolation transformer, said ratio transformer including a slide arm, a variable resistor connected to said slide arm across said first ratio transformer, the second side of said ratio transformer being connected to the second side of said load a second ratio transformer connected across said first named load, a second instrument, said second ratio transformer including a slide arm connected to one side of said second instrument, a lead connecting the other side of said second instrument to said second ratio transformer, and means for moving said slide arms in unison to corresponding positions.



3,899,734
MAGNETIC FLUX LEAKAGE INSPECTION METHOD AND APPARATUS INCLUDING MAGNETIC DIODES

Ruby C. Beaver, Houston, Tex.; Theodor Clasen, Wienhausen; Wolfgang Henning, Celle, both of Germany, and Emil S. Johnson, Houston, Tex., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.

Continuation-in-part of Ser. No. 360,161, May 14, 1973, abandoned. This application Mar. 15, 1974, Ser. No. 451,505
Int. Cl.[2] G01R 33/12
U.S. Cl. 324—37 19 Claims



1. An inspection apparatus for inspecting a magnetizable test object having at least one surface, said apparatus comprising

a support;

magnetizing means mounted on said support for magnetizing said test object;

sensing means mounted on the support adjacent to said magnetizing means and for detecting magnetic flux leakage from the test obect caused by flaws in the test object, said sensing means including a plurality of single magnetic diodes disposed in pairs in magnetic opposition and connected electrically to form twin diodes whose output signals are substantially independent of temperature; and means cooperating with said support for moving said support to cause the magnetizing and sensing means to traverse the surface of the test object in sufficiently close

proximity to magnetize said test object and to inspect said test object with said sensing means; wherein

the twin diodes are connected electrically to form at least two separate groups, each group having a plurality of twin diodes; and

the twin diodes in each group are spaced along a path so that the distance between the centers of any two adjacent twin diodes in that group is no more than approximately one-half the longest linear dimension along said path of the smallest flaw sought to be detected; and

the groups are spaced along the path so that each group is adjacent to at least one other group; and

the groups are spaced along the path in overlapping relationship so that at least one twin diode in each group is between at least two twin diodes of each adjacent group, whereby said smallest flaw will be detected by at least two twin diodes in one of the groups when said path of twin diodes is moved over said flaw.

3,899,735

VOLTAGE DETECTOR FOR DETECTING AC VOLTAGES

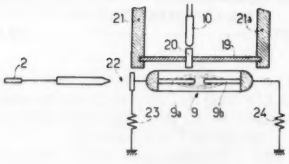
Edouard Singer, 53, rue de Mulhouse, 68790 Morschwiller-le-Bas, France

Continuation-in-part of Ser. No. 237,108, March 22, 1972, abandoned. This application Jan. 23, 1974, Ser. No. 435,776

Claims priority, application France, Mar. 22, 1971, 71.11200; Jan. 19, 1972, 72.02482

Int. Cl. G01r *13/40, 19/16*

U.S. Cl. 324—122 **12 Claims**



1. A voltage detector comprising: a glow lamp having two spaced apart electrodes responsive to a voltage under test during use for developing light energy in an illuminating discharge region having an area proportional to the magnitude of the voltage under test;

light sensitive means responsive to said light energy for developing an electrical signal in response thereto;

a movable screen disposed between said glow lamp and said light sensitive means and having means defining a tubular aperture therethrough to permit the light energy from said glow lamp to pass therethrough and illuminate said light sensitive means to develop the electrical signal;

means for adjustably positioning said screen relative to said glow lamp and said light sensitive means to define the area of said discharge region which will illuminate said light sensitive means and thereby determine a voltage threshold for the voltage under test above which the electrical signal will be developed; and

indicating means responsive to said electrical signal for developing an alarm signal having a predetermined magnitude independent of the magnitude of the voltage under test to indicate that the voltage under test has a magnitude greater than the voltage threshold value.

3,899,736

VIBRATION-RESISTANT DEVICE FOR TAUT BAND SUSPENSION TYPE INDICATING INSTRUMENT

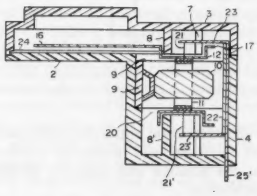
Takehiko Sakaguchi, Sakaki, Japan, assignor to Hioki Electric Works Co., Ltd., Sakaki, Japan

Filed Dec. 5, 1973, Ser. No. 421,868

Claims priority, application Japan, Dec. 5, 1972, 47-121840

Int. Cl.[2] G01R *5/10, 5/02, 1/14*

U.S. Cl. 324—154 R **1 Claim**



1. In an electrical indicating instrument of the type comprising a casing for holding said instrument therein, a magnet, a moving coil, and a taut metal band serving as the rotating axis of the moving coil located in the magnetic field of the magnet, the taut band being suspended between support members,

the improvement for providing a vibration-resistant device, wherein said casing comprises a lower cylindrical portion, an intermediate base portion and a cover, and wherein said instrument further includes moving coil displacement preventive rings disposed concentrically with the rotating axis on both sides of the moving coil, and moving coil displacement preventive cylinders within the casing and integral thereto and opposite to each other and closely adjacent to the moving coil displacement preventive rings on both sides, each of said rings having a planar portion with elements projecting from the periphery of said planar portion to provide a cup-like configuration, said coil displacement preventive cylinders projecting into said cup-like configurations, one of said coil displacement preventive cylinders being integral with said cover and the other being integral with the bottom of said cylindrical portion of said casing.

3,899,737

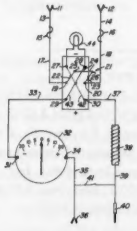
APPARATUS FOR TESTING ALTERNATOR DIODES

Owen Aston, Salt Lake City, Utah, assignor to Carl R. Haueter, Salt Lake City, Utah, a part interest

Filed Oct. 12, 1972, Ser. No. 296,802

Int. Cl. G01r *31/22, 1/36*

U.S. Cl. 324—158 D **7 Claims**



1. Apparatus for testing alternator diodes, comprising in combination:

coupling means comprising first, second, third, and fourth couplings adapted for connection respectively to the negative terminal of an electrical source, the positive terminal of an electrical source, an alternator and to a diode of said alternator;

an amperage metering circuit having means for indicating amperage of current flowing in either direction in the circuit, said circuit being connected in series with the third coupling;

a current limiting circuit having current limiting choke means, said circuit being connected in series with the fourth coupling, circuit switching means having means for alternately connecting said amperage metering circuit with the first coupling and with the second coupling and for alternately connecting said current limiting circuit with said first coupling and with said second coupling and switching means disposed between said third and fourth couplings for alternatively closing and opening the circuit between said couplings.

3,899,738

SYSTEM FOR MEASURING GROUP DELAY AND/OR ATTENUATION IN CLOSED SIGNAL-TRANSMISSION LOOP

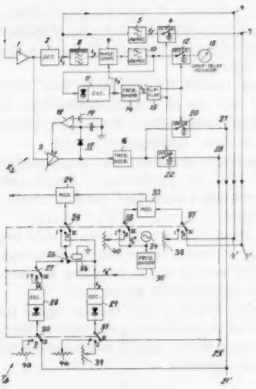
Peter Harzer, Eningen, Germany, assignor to Wandel u. Goltermann, Reutlingen, Germany

Continuation of Ser. No. 355,492, April 30, 1973, abandoned. This application Aug. 8, 1974, Ser. No. 495,848

Claims priority, application Germany, Apr. 29, 1972, 2221256

Int. Cl. H04b 7/14

U.S. Cl. 325—2 **15 Claims**



1. A system for sending amplitude-modulated carrier waves over transmission paths linking a plurality of measuring stations in a closed loop, said stations serving to determine the characteristics of said transmission paths, comprising:

a receiving section and a transmitting section at each measuring station;

a wave synthesizer in said transmitting section including oscillation-generating means for producing separate high-frequency carrier oscillations and low-frequency modulating oscillations, said wave synthesizer further including modulating means for combining said oscillations into an outgoing amplitude-modulated carrier wave;

processing means in said receiving section for isolating a carrier component and a modulating component of an incoming amplitude-modulated carrier wave, said processing means including output circuitry producing signal voltages derived from at least one of said components;

evaluation means in said receiving section connected to said output circuitry for translating a signal voltage thereof into an indication of a transmission characteristic of a transmission path terminating at said receiving station;

switch means in at least one of said measuring stations selectively settable in a basic position and at least one alternate position; and

conductor means in said one of said measuring stations connected to said output circuitry of the receiving section thereof for energization by at least some of said signal voltages, said conductor means being connected in said alternate position of said switch means to said wave synthesizer of the associated transmitting section for modifying the operation thereof to replicate a parameter of a component of said incoming carrier wave in a corresponding constituent of said outgoing carrier wave, said wave synthesizer being disconnected from said conductor means in said basic position of said switch means.

3,899,739

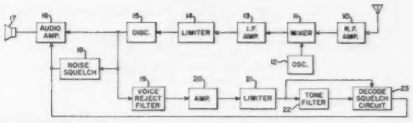
DECODE SQUELCH CIRCUIT FOR A CONTINUOUS TONE CONTROL RADIO RECEIVER

Arthur L. Herman, Lynchburg, Va., assignor to General Electric Company, N.Y.

Filed Sept. 4, 1973, Ser. No. 393,807

Int. Cl. H04b 1/10

U.S. Cl. 325—319 **3 Claims**



1. In a radio receiver having means to be unsquelched in response to an unsquelch signal and to be squelched in response to a squelch signal, an improved decode squelch circuit comprising:

a. means adapted to be connected to said radio receiver for deriving a continuous tone therefrom that is transmitted over a system to said radio receiver;

b. first means connected to said deriving means for producing a first tone signal of a first phase;

c. second means connected to said deriving means for producing a second tone signal of a second phase that is shifted substantially 180 degrees with respect to said first phase;

d. a first transistor having input and output electrodes;

e. means connecting said first transistor input electrodes to said first means;

f. means connected to said first transistor input electrodes for preventing said first transistor from responding to said first tone signal;

g. a second transistor having input and output electrodes;

h. means connecting said second transistor input electrodes to said second means;

i. means connecting said output electrodes of said second transistor to said input electrodes of said first transistor for permitting said first transistor to respond to said first tone signal at said first input in response to said second tone signal at said second input;

j. a capacitor;

k. means connecting said capacitor to said output electrodes of said first transistor to charge said capacitor in response to said first transistor being prevented from responding to said first tone signal, and to discharge said capacitor in response to said first transistor being permitted to respond to said first tone signal;

l. an output transistor having input and output electrodes;

m. means connecting said input electrodes of said output transistor to said capacitor for causing said output transistor to produce a squelch signal in response to said capacitor being charged above a selected level and for causing said output transistor to produce an unsquelch signal in

response to said capacitor being discharged below a selected level;

n. means connected between said output electrodes of said output transistor and said electrodes of said second transistor for causing said second transistor to respond to second tone signals of a lower magnitude in response to said output transistor producing an unsquelch signal;

o. and output means connected to said output electrodes of said output transistor for applying said squelch and unsquelch signals to said receiver.

3,899,740

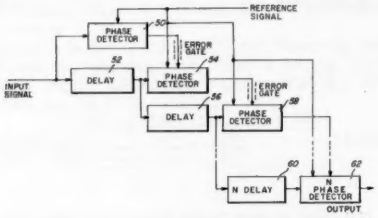
FM SIDETONE PHASE COMPARISON SYSTEM

Manfred G. Unkauf, Franklin; Derek V. Harris, Acton, and Sven G. Gustafsson, Framingham, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 297,144, Oct. 12, 1972, abandoned, which is a continuation of Ser. No. 85,615, Oct. 30, 1970, abandoned. This application Nov. 21, 1973, Ser. No. 417,986

Int. Cl.[2] H04B *1/16*

U.S. Cl. 325—349 **12 Claims**



1. A phase determining system comprising in combination:

means for producing a reference signal;

a plurality of serially coupled phase determining stages, each of said stages comprising in combination:

means for receiving a frequency modulated signal;

means for detecting phase variations in a modulation component of said frequency modulated signal;

means for removing disturbance portions in said modulation component when said phase variations exceed a predetermined value; and

means for comparing the phase of the unremoved modulation component of said frequency modulated signal with the reference signal, whereby an accurate phase comparison is made after the said phase disturbance portions have been removed.

3,899,741

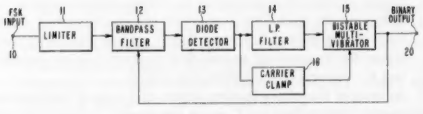
FREQUENCY SHIFT KEYED DETECTOR

Randy Brandt, Cupertino, and Richard B. Rice, Los Gatos, both of Calif., assignors to Cermetek, Inc., Mountain View, Calif.

Filed Nov. 12, 1973, Ser. No. 414,935

Int. Cl.[2] H04L *27/14*

U.S. Cl. 329—104 **13 Claims**



1. A frequency shift keyed detector comprising:

input signal limiter means for receiving a frequency shift keyed signal the frequency of which is to be determined, and for producing a first intermediate signal at the same frequency as said frequency shift keyed signal;

bandpass filter means for passing said first intermediate signal thereby to remove the harmonics and noise outside of the pass band of said bandpass filter means from said first intermediate signal and for producing a second intermediate signal at the same frequency as said first intermediate signal;

rectifying means for receiving said second intermediate signal and for producing a rectified third intermediate signal representative of the amplitude of said second intermediate signal;

low pass filter means for smoothing said third intermediate signal and for producing a fourth intermediate signal representing a smoothed version of said third intermediate signal;

output signal means responsive to said fourth intermediate signal for producing an output signal, said output signal being capable of assuming two different levels in response to the amplitude of said fourth intermediate signal; and

means, responsive to changes in the level of said output signal, for changing the center frequency of said bandpass filter means.

12. A frequency shift keyed detector comprising:

input signal limiter means for receiving a frequency shift keyed signal, the frequency of which is to be determined, and for producing a first intermediate signal at the same frequency as said frequency shift keyed signal;

bandpass filter means for passing said first intermediate signal thereby to remove the harmonics and noise outside of the passband of said passband filter means from said first intermediate signal and for producing a second intermediate signal at the same frequency as said first intermediate signal;

rectifying means for receiving said second intermediate signal and for producing a rectified third intermediate signal representative of the amplitude of said second intermediate signal;

low pass filter means for smoothing said third intermediate signal and for producing a fourth intermediate signal representing a smoothed version of said third intermediate signal;

output signal means responsive to said fourth intermediate signal for producing an output signal capable of assuming two different levels in response to the amplitude of said fourth intermediate signal; and

means for disabling said output signal means for a given period of time following the start of the detection process to prevent noise signals from inadvertently starting said detector circuit.

3,899,742

AMPLIFIER APPARATUS HAVING COMBINED DC AND AC DEGENERATIVE FEEDBACK

Dooho Yum, Elk Grove; Peter A. Mercola, and William R. Jacobs, both of Wilmette, all of Ill., assignors to Beltone Electronics Corporation, Chicago, Ill.

Filed Mar. 20, 1974, Ser. No. 452,747

Int. Cl.[2] H03F *3/343*, *1/08*

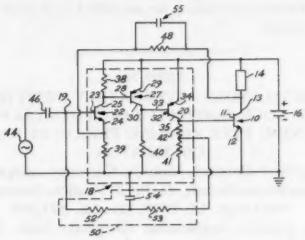
U.S. Cl. 330—19 **13 Claims**

1. In a system for amplifying an alternating input signal including a driver element comprising a driver input circuit having a non-linear characteristic and a driver output circuit for conducting an output current corresponding to the alternating input signal through a load, said output current having an alternating component and a DC component, improved apparatus for varying the DC component of current flowing in the output circuit to improve the efficiency and linearity of the system comprising in combination:

bias means for producing a quiescent DC voltage on the driver input circuit which maintains the DC component of the driver element output current at a low level in the absence of an alternating input signal;

preamplifier means having an input terminal adapted to receive the input signal and an output terminal coupled to the driver input circuit for producing a driver input voltage on the output terminal;

degenerative AC feedback means for feeding a portion of the alternating component of the output current back to the preamplifier so as to reduce the amplitude of the alternating input signal and to allow the alternating input signal to be modified by the non-linear characteristic of



the driver input circuit in order to produce a non-linear form of driver input voltage; and

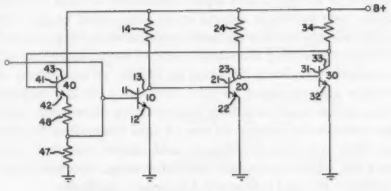
DC feedback means for applying at least a portion of the DC voltage on the driver input circuit to the preamplifier means so as to urge the average DC voltage on the driver input circuit in a direction which increases the DC component of the driver element output current as the magnitude of the alternating input signal increases to provide linear amplification of the alternating input signal.

3,899,743

BIASING CIRCUIT FOR MULTISTAGE TRANSISTOR AMPLIFIERS

Antal Csicsatka, Decatur, Ill., assignor to General Electric Company, Syracuse, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,505
Int. Cl.² H03F *3/04*
U.S. Cl. 330—22 **8 Claims**



1. In a multistage electronic amplifier having first and last stages comprising first and last transistors, each of said transistors having an impedance for connecting one terminal thereof to a direct current bias potential source, a circuit for biasing an input terminal of said first transistor comprising:

a multiterminal semiconductor device developing a substantially constant direct current voltage between two terminals thereof,

means for connecting a first terminal of said two terminals of said multiterminal semiconductor device to said one terminal of said last transistor,

first and second resistors connected in series between an input terminal of said first transistor and a common point, said first and second resistors having a common terminal mediate said first and second resistors, the second terminal of said two terminals of said multiterminal semiconductor device being connected to said mediate terminal,

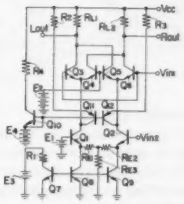
said multiterminal semiconductor device having a third terminal arranged for connection to a direct current bias potential source, said multiterminal semiconductor device being operative to cause a current to flow into said input terminal of said first transistor to cause said first transistor to be rendered active.

3,899,744

TRANSISTOR AMPLIFIER CIRCUIT

Yasuo Kominami, Kokubunji, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 7, 1974, Ser. No. 440,355
Claims priority, application Japan, Feb. 7, 1973, 48-14660
Int. Cl.² H03F *3/45, 3/68*
U.S. Cl. 330—30 D **1 Claim**



1. A transistor amplifier circuit comprising:

first to sixth transistors, each having an emitter, a base and a collector;

a first resistor, one end of which is connected to the emitter of said first transistor;

a second resistor, one end of which is connected to the emitter of said second transistor;

a third resistor, one end of which is connected to ground;

means for connecting the other ends of said first to third resistors in common;

means for connecting the emitters of said third and fourth transistors with the collector of said first transistor;

means for connecting the emitters of said fifth and sixth transistors with the collector of said second transistor;

means for connecting the base of the third transistor with the base of the sixth transistor;

means for connecting the base of the fourth transistor with the base of the fifth transistor;

a fourth resistor, one end of which is connected to the collectors of said third and fifth transistors;

a fifth resistor, one end of which is connected to the collectors of said fourth and sixth transistors;

means for connecting the other ends of said fourth and sixth resistors with a first voltage source;

means for connecting the base of said first transistor with a second voltage source;

means for connecting the bases of said fourth and fifth transistors with a third voltage source;

first input means for applying a first input signal to the base of said sixth transistor;

second input means for applying a second input signal to the base of said second transistor;

a first constant current circuit connected between the emitter of said first transistor and ground;

a second constant current circuit connected between the emitter of said second transistor and ground;

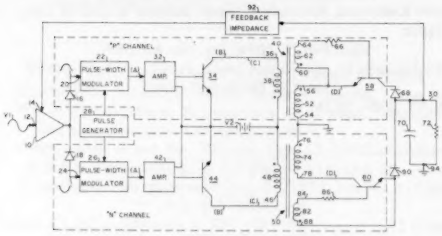
a third constant current circuit connected between the collector of said first transistor and said first voltage source; and

a fourth constant current circuit connected between the collector of said second transistor and said first voltage source.

3,899,745
ISOLATED OUTPUT SYSTEM FOR A CLASS D SWITCHING-MODE AMPLIFIER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and Martial A. Honnell, Auburn, Ala.

Filed Apr. 26, 1974, Ser. No. 464,723
Int. Cl.[2] H03F *21/00*
U.S. Cl. 330—207 A **5 Claims**



1. A Class D amplifier comprising:

input signal means responsive to an input signal for providing a first signal output corresponding to the positive polarity content of said input signal and a second signal output corresponding to the negative polarity content of said input signal;

first and second pulse-width modulators, said first modulator being responsive to said first output for providing a chain of first output pulses wherein the width of each pulse is proportional to the instantaneous level of said first output, and said second modulator being responsive to said second output for providing a chain of second output pulses wherein the width of each pulse is proportional to the instantaneous level of said second output;

a DC power source;

a first output stage comprising:

first switching means comprising a two-terminal switched circuit responsive to the presence of a said first output pulse for presenting a closed circuit and otherwise presenting an open circuit,

a first transformer comprising a primary winding and at least one secondary winding,

connecting means connecting said power source in series with said primary winding and said two-terminal switched circuit, and

second switching means comprising a two-terminal switched circuit in series with said secondary winding and being responsive to a discrete polarity output of said transformer for providing a first stage output from said first secondary winding of a first polarity and responsive to the release of stored energy previously supplied through said primary winding to the core of said first transformer, and otherwise said second switching means blocking current flow through said secondary winding;

a second output stage comprising:

third switching means comprising a two-terminal switched circuit responsive to the presence of a said second output pulse for presenting a closed circuit and otherwise presenting an open circuit,

a second transformer comprising a primary winding and at least one secondary winding,

connecting means for connecting said power source in series with said primary winding of said second transformer and said two-terminal switched circuit of said third switching means, and

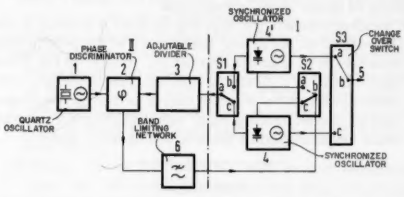
fourth switching means comprising a two-terminal switched circuit in series with said secondary winding of said second transformer and being responsive to a discrete polarity output of said second transformer for providing a second circuit output from said secondary winding of said second transformer of a second polarity responsive to the release of stored energy previously supplied through said primary winding of said second transformer to the core of said second transformer and otherwise said fourth switching means blocking current flow through said secondary winding of said second transformer; and

filter means coupled to receive said first and second circuit outputs of said first and second output stages for eliminating pulse switching occurrences and thereby recreating an amplified replica of said input signal.

3,899,746
TWO OSCILLATORS ALTERNATELY SWITCHED INTO A PHASE LOCK LOOP WITH OUTPUTS TAKEN ONLY DURING FREE RUNNING PERIOD OF EACH OSCILLATOR

Josef Engelbert Gammel, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 14, 1973, Ser. No. 397,401
Claims priority, application Germany, Sept. 22, 1972, 2246487
Int. Cl. H03b *3/04*
U.S. Cl. 331—2 **7 Claims**



1. A stabilized oscillator circuit comprising two controlled oscillator stages, an output terminal, first switching means for periodically switching said output terminal from the output of one oscillator stage to the output of the other, each of said controlled oscillator stages being stable within predetermined limits for a given period when free running, a reference oscillator circuit, an adjustable frequency divider network, a phase discriminator having a first input connected to said reference oscillator, and having a second input connected to an output of said frequency divider network, second switching means for selectively connecting alternately one of said controlled oscillator stages into a loop between an output of said phase discriminator and an input of said frequency divider network, said first and second switching means being alternately operative to connect the output of one of said controlled oscillator stages while it is free-running to said output terminal and to connect the other controlled oscillator stage into said loop to be stabilized by said reference frequency oscillator.

3,899,747
ARRANGEMENT FOR PROVIDING RADIO EQUIPMENT WITH A PLURALITY OF OSCILLATORS

Olin S. Giles, and Edwin C. Lafferty, both of Lynchburg, Va., assignors to General Electric Company, N.Y.

Filed Sept. 26, 1973, Ser. No. 400,842
Int. Cl. H03b *3/04*
U.S. Cl. 331—2 **5 Claims**

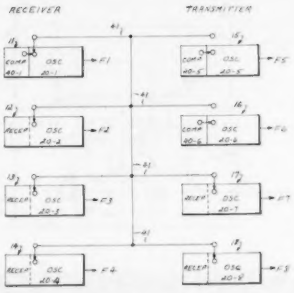
1. An improved arrangement for providing radio apparatus with a plurality of oscillators, some of which have a high frequency stability and some of which have a low frequency stability, said improved arrangement comprising:

a. a plurality of substantially similar oscillator modules each having an oscillator circuit substantially similar to the other oscillator circuits, a compensator input for said oscillator circuit, and a compensator receptacle;

b. a first compensator positioned in a first of said modules;

c. means connecting the output of said first compensator to only the compensator input of the oscillator in said first module for providing said oscillator of said first module with said high frequency stability;

d. a second compensator positioned in a second of said modules;



e. and means connecting the output of said second compensator in parallel with the compensator input of the oscillator in said second module and to the compensator input of the oscillator in at least a third module for providing said oscillators of said second and third modules with said low frequency stability.

3,899,748

METHOD FOR THE FREQUENCY STABILIZATION OF A LASER

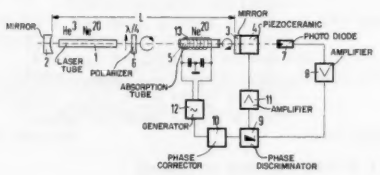
Viktor Bodlaj, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 27, 1972, Ser. No. 292,613

Claims priority, application Germany, Sept. 27, 1971, 2148193

Int. Cl. H01s *3/11*

U.S. Cl. 331—94.5 S **3 Claims**



1. A method for the frequency stabilization of a laser of the type wherein an active laser medium is situated in a resonator between a fixed mirror and a movable mirror, said movable mirror attached to a piezo ceramic and movable in the axial direction of the laser upon energization of the piezo ceramic, and wherein the laser radiation is circularly polarized and passes through an absorption tube within a magnetic coil in the resonator and filled with the laser active gas, and a photosensitive element behind the absorption tube and outside the resonator receives the laser beam and produces a signal which is proportional to the frequency deviation of the laser radiation from the center frequency γ_0 caused by the absorption tube, and wherein the laser radiation is intensity modulated by an alternating energization of the coil and comprising the steps of:

comparing the amplitude and phase of the signal produced by the photosensitive element with the alternating wave which energizes the coil, the alternating wave depending on the center frequency γ_0 caused by the absorption tube, of the inverse Lamb-dip in the laser power-frequency characteristic, to produce a control signal; and

applying the control signal to the piezo ceramic to produce a change of length of the resonator.

3,899,749

GAS DYNAMIC LASERS

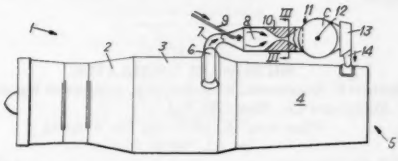
Roland John Hill, Quarndon, and Norman Thomas Jewell, Mickleover, both of England, assignors to Rolls-Royce Limited, London, England

Filed July 18, 1972, Ser. No. 272,842

Claims priority, application United Kingdom, July 20, 1971, 33872/71

Int. Cl. H01s *3/09, 3/22*

U.S. Cl. 331—94.5 P **30 Claims**



1. A method of producing a laser beam, comprising diverting gases from their normal flow path through a continuous combustion engine into an auxiliary flow path, injecting into said diverted gases at least one additional substance to produce a gaseous mixture having a composition suitable for the support of lasing therein, aerodynamically expanding said gases supersonically to produce an energy population inversion in a lasing species of the mixture, and stimulating the production of said laser beam in an optically resonant cavity, said continuous combustion engine being a gas turbine engine.

3,899,750

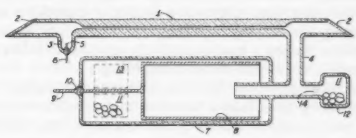
LONG LIFE GAS LASER SYSTEM AND METHOD

Urs E. Hochuli, 7011 Southwark Ter., Hyattsville, Md. 20782

Filed Sept. 21, 1973, Ser. No. 399,295

Int. Cl.² H01S *3/02*

U.S. Cl. 331—94.5 G **3 Claims**



1. In a gas laser having means forming an elongated gas filled bore, an anode and a low current density oxidized metal cathode at the respective ends of said bore, the improvement for extending the life of said laser comprising a source of gaseous impurities communicating with said cathode, said gaseous impurities having a partial pressure below about 10^{-3} Torr, wherein said impurity being selected from the group comprising hydrogen, oxygen, water vapor and mixtures thereof.

3,899,751

LONG LIFE MOLECULAR GAS LASER

Urs E. Hochuli, 7011 S. Wark Ter., Hyattsville, Md. 20782

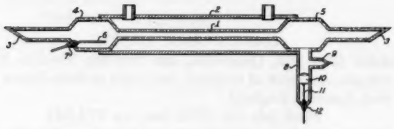
Filed Dec. 3, 1973, Ser. No. 421,135

Int. Cl.² H01S *3/00*

U.S. Cl. 331—94.5 T **14 Claims**

1. In a CO_2 gas laser having means forming an elongated gas filled bore, an anode and a cold cathode for laser excitation of the gas in said bore, the improvements for extending the life of said gas laser comprising a reducing gas mixture compatible

with laser action in combination with a cold cathode material whose discharge created scale can be reduced over a substantially short time interval by said gas mixture to minimize layers



of scale matter on the cold cathode and in the sputtering products thus maintaining the partial pressures of the gas mixture components over a period of time of at least 10,000 hours.

3,899,752

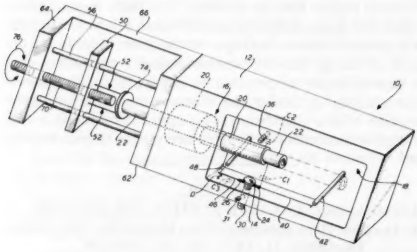
MICROWAVE OSCILLATOR

Herbert F. Engelmann, Kinnelon, N.J., assignor to Engelmann Microwave Co., Montville, N.J.

Filed Nov. 15, 1973, Ser. No. 416,082

Int. Cl.² H03B *5/24*

U.S. Cl. 331—101 **4 Claims**



1. In a tunable wide band microwave oscillator having a frequency band including a high frequency end, and which tunable wide band microwave oscillator includes a resonator assembly for varying the frequency of said oscillator and a transistor having a lead capactively coupled to said resonator assembly, the improvement comprising:

mechanical means for supporting said transistor and for varying the distance between said transistor and thereby said transistor lead and said resonator assembly to vary the capacitive coupling between said transistor lead and said resonator assembly to provide optimum capacitive coupling between said transistor lead and said resonator assembly for maximum power output from said oscillator at the high frequency end of said frequency band;

a housing in which said resonator assembly is mounted and which receives said transistor means; and

said mechanical means mounted reciprocably in said housing for moving said transistor and thereby said transistor lead toward or away from said resonator assembly.

3,899,753

CONTROLLED HIGH FREQUENCY TRANSISTOR CRYSTAL OSCILLATOR

Shashi D. Malaviya, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 6, 1974, Ser. No. 466,942

Int. Cl.² H03B *5/36*

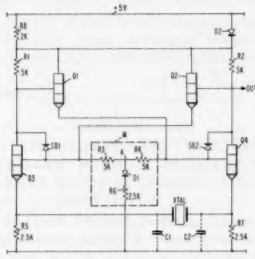
U.S. Cl. 331—109 **5 Claims**

1. A controlled amplitude oscillator comprising:

a. collector-to-base cross-coupled first and second transistors;

b. a piezoelectric crystal connected between the emitters of said first and second transistors; and

c. a mixer circuit connected between the bases of said first and second transistors, wherein said mixer circuit comprises



d. two like resistors connected in series between said bases; and

e. a third resistor connected from the common junction of said like resistors to a reference potential.

3,899,754

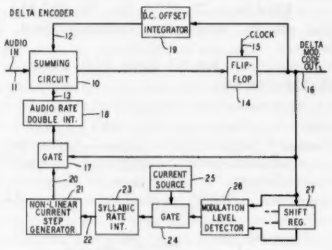
DELTA MODULATION AND DEMODULATION WITH SYLLABIC COMPANDING

Stephen Joseph Brolin, Livingston, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 9, 1974, Ser. No. 468,449

Int. Cl.² H03K *13/22*

U.S. Cl. 332—11 D **13 Claims**



1. A delta modulator comprising

a comparator,

a source of input signals to one input of said comparator,

a source of feedback signals around said comparator to the other input of said comparator,

a pulse generator for generating an output pulse when said input signal exceeds said feedback signal as determined by said comparator, and

a feedback circuit utilizing said output pulses to generate said feedback signals,

characterized in that

said feedback circuit includes a syllabic rate integrator having a charging time-constant proportional to syllabic attack times and a discharging time-constant proportional to syllabic decay times.

6. A delta encoder comprising

a digitally-controlled feedback circuit, and

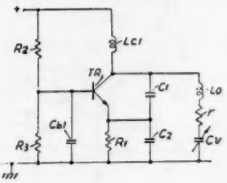
a syllabic rate integrator in said feedback circuit having different charging and discharging time constants, said charging time constant being proportional to syllabic attack time and said discharging time constant being proportional to syllabic decay time.

3,899,755

FREQUENCY MODULATOR INCLUDING A CLAPP-TYPE OSCILLATOR

Teiji Uchida, c/o Nippon Electric Co. Ltd., Minatoku, Tokyo, Japan

Filed Sept. 28, 1966, Ser. No. 582,710
Claims priority, application Japan, Nov. 10, 1965, 40-69015
Int. Cl. H03c 3/22
U.S. Cl. 332—30 1 Claim



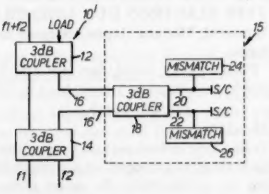
1. In a transistorized frequency modulator of the type including a Clapp-type oscillator having a transistor and a frequency defining circuit connected across the emitter and collector of the transistor and composed of an inductive element and a plurality of capacitive elements, the improvement for improving the oscillation frequency versus output power characteristics of the modulator comprising a variable capacitance diode substituted for one of said capacitive elements; means for supplying a modulating signal across said variable capacitance diode; and, means connected to said signal supplying means and said variable capacitance-diode for supplying a portion of said modulating signal to one control terminal of said transistor, thereby to increase the collector current when the capacitance of said variable capacitance diode decreases in response to a variation in the voltage of said modulating signal.

3,899,756

MICROWAVE PHASE CORRECTING NETWORK UTILIZING WAVEGUIDE COUPLER HAVING MISMATCHED PORTS CAUSED BY LATERALLY DISPLACED END SECTION

Janos Bodonyi, Bicknacre, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Apr. 11, 1974, Ser. No. 459,950
Claims priority, application United Kingdom, May 5, 1973, 21480/73
Int. Cl.² H01P 1/20, 5/18, 9/00
U.S. Cl. 333—10 11 Claims



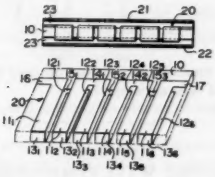
1. A phase correcting network for improving the phase/frequency characteristic of a delay line including a 3dB coupler adapted to be inserted in the said delay line and terminated in a pair of short circuited waveguide stubs, each of said waveguide stubs being susceptance loaded by means of at least one mismatch achieved by laterally displacing sections of the waveguide relative to one another in the direction of the H-plane.

3,899,757

SQUARE TURNING MEANDER LINE

Takakiyo Nakagami, Tokyo; Kazunari Hatanaka, Yokohama, and Masayuki Ishizaki, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 5, 1974, Ser. No. 448,287
Claims priority, application Japan, Mar. 19, 1973, 48-31581
Int. Cl.² H01P 9/00
U.S. Cl. 333—31 R 5 Claims



1. A square turning meander line comprising:

a dielectric plate having first and second parallel, generally planar surfaces,

a continuous conducting line formed on said plate and disposed to include first and second pluralities of parallel conducting lines on said first and second surfaces, respectively, of said dielectric plate with corresponding ones of said lines of said first and second pluralities in opposed relationship, first commonly disposed ends of corresponding, opposed lines of said first and second pluralities thereof being connected and the other ends of adjacent lines of each plurality being connected in paired relationship and in alternate succession as to said first and second pluralities thereof,

each of said lines being of a common length and of a common width selected in accordance with a desired frequency characteristic of the said meander line and adjacent said parallel lines of each said plurality plate being separated by a distance less than the said common width thereof, and

first and second parallel, spaced earth conductors, said dielectric plate with said continuous line thereon being positioned in parallel relationship in the spaced between said first and second earth conductors.

3,899,758

VARIABLE INDUCTIVE RESONANT CIRCUIT ARRANGEMENT HAVING A DIAMAGNETIC CORE FOR THE UHF RANGE

Gerhard Maier, Schwenningen, and Bertram Fischer, Deisslingen, both of Germany, assignors to GTE International, Stamford, Conn.

Filed May 1, 1974, Ser. No. 465,859
Int. Cl.² H03H 13/00, 5/12
U.S. Cl. 333—70 S 3 Claims

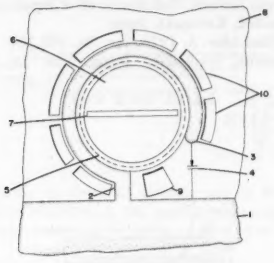
1. A variable, predominately inductive resonant circuit assembly for the UHF range of a transistorized UHF television employing varactor tuners comprising:

a threaded member of insulating material disposed within an aperture of a printed circuit board;

an arcuate conductor strip having apertures surrounding the extreme periphery thereof and having less than one turn surrounding and affixed to said threaded member of insulating material;

a core of diamagnetic material disposed within said

threaded member of insulating material, said core including means for adjustment; and



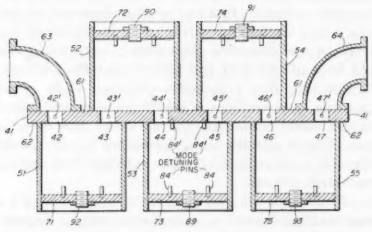
varactor diode means coupling said arcuate conductor strip to a potential reference level.

3,899,759

ELECTRIC WAVE RESONATORS

Marion E. Hines, Weston, and Konrad K. Benz, Winchester, both of Mass., assignors to Microwave Associates, Inc., Burlington, Mass.

Filed Apr. 8, 1974, Ser. No. 458,564
Int. Cl.[2] H01P *1/16, 1/20, 7/06*
U.S. Cl. 333—73 W **18 Claims**



1. An electric-wave cavity resonator with a plurality of modes or resonance in a given frequency band intended for operation in a single one of said modes in said band of frequencies, comprising electrically-conductive surrounding walls to define said cavity, coupling means on one or more of said walls, and mode detuning means comprising one or more elongated conductive pins having no cross-sectional dimension that is greater than a minor fraction of the length dimension placed within the cavity in positions and orientations so selected that the length dimension of each lies substantially perpendicular to the high frequency electric field of said single mode of resonance and substantially parallel to the high frequency electric field of others of said modes of resonance for tuning the resonance frequency of said cavity for said other modes to frequencies outside of said frequency band with substantially minimum addition of surface upon which electric currents must flow.

3,899,760

ELECTRONIC CHANNEL ADDRESS REMOTE CONTROL SYSTEM

David Lee Funston, Batavia, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

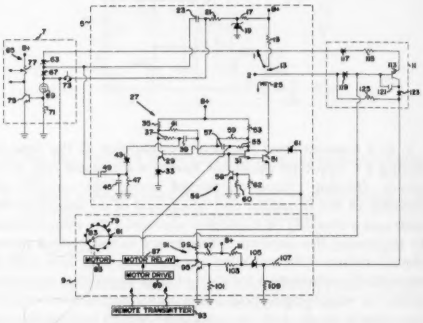
Filed May 17, 1974, Ser. No. 471,040
Int. Cl.[2] H03J *1/06*
U.S. Cl. 334—9 **7 Claims**

1. In a signal receiver having a potential source, a varactor tuner, and a remote signal channel selecting means, an electronic channel address system comprising:

means coupled to said potential source for remote-manual switching, said means including a switching relay means coupled to a memory circuit;

means coupled to said means for remote-manual switching and to said varactor tuner for manual signal channel selection;

means coupled to said means for remote-manual switching and said means for manual signal channel selection for remote signal channel selection, said means including control circuitry coupled to a motor means mechanically connected to a rotary switching means and motor drive



means coupled to said motor and responsive to said remote signal channel selecting means; and

means coupled to said control circuitry and rotary switching means of said means for remote signal channel selection, to said means for manual signal channel selection, and to said means for remote-manual switching for effecting tracking of manual signal channel selection by said means for remote signal channel selection, said tracking means altering said control circuitry and rotary switching means in response to manual signal channel selection to provide alignment of said rotary switching means with said manually selected signal channel and a path for current flow therethrough.

3,899,761

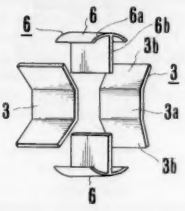
COLOUR PICTURE TUBES CONTAINING AN IN-LINE TYPE ELECTRON GUN ASSEMBLIES

Masaaki Yamauchi, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 21, 1974, Ser. No. 444,275
Claims priority, application Japan, May 4, 1973, 48-49112
Int. Cl.[2] H01F *3/12*
U.S. Cl. 335—211 **2 Claims**

1. In an in-line type colour picture tube of the type comprising three electron guns arranged on a straight line, and means for adjusting on substantially the same plane the dynamic convergence and the static convergence provided for concentrating three electron beams emanated from said three electron guns at a point on the fluorescent screen of said colour picture tube, the improvement which comprises a pole piece assembly disposed in said plane of convergence adjustment, said pole piece assembly including a first pair of spaced pole piece segments substantially symmetrically disposed with respect to a plane perpendicular to said straight line, which plane passes through the axis of a central electron gun, one of

said first paired pole piece segments being disposed between the axes of the central electron gun and an outer electron gun, the other being disposed between the axes of the central electron gun and the other outer electron gun, individual segments of said first paired pole piece segments being disposed also symmetrically with respect to another plane passing through the axes of the three electron guns and opposed to each other by a smaller distance at said straight line than at



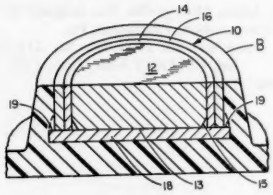
the extremities remote from said straight line, and a second pair of pole piece segments being disposed symmetrically with respect to said plane passing through the axes of three electron guns, individual segments of said second paired pole piece segments being disposed also substantially symmetrically with respect to said plane perpendicular to said straight line and passing through the axis of the central electron gun, and having a web projecting toward said central electron gun substantially on the last mentioned plane.

3,899,762

PERMANENT MAGNETIC STRUCTURE

Robert J. Studders, Toledo, Ohio, assignor to Permag Magnetics Corporation, Toledo, Ohio

Filed Oct. 3, 1974, Ser. No. 511,681
Int. Cl. H01f *7/02*
U.S. Cl. 335—302 **12 Claims**



1. A permanent magnet structure for casting in a non-magnetic plastic support, said structure comprising:

A. a central non-corrosive permanent magnetic core of outside uniform cross-section with opposite parallel pole surfaces on the opposite axial ends thereof,

B. a non-magnetic non-corrosive inner sleeve intimately surrounding said core extending between and to said parallel pole surfaces,

C. a magnetic non-corrosive outer sleeve intimately surrounding said inner sleeve and also extending between and to said parallel pole surfaces, and

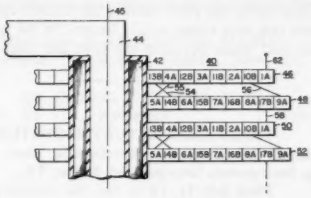
D. a magnetic pole plate slightly larger in outer circumference than the outer circumference of said outer sleeve and magnetically held against one of said pole surfaces, said structure being cast into a non-magnetic plastic support so that only the other said pole surface is exposed.

3,899,763

INTERLEAVED WINDING FOR ELECTRICAL INDUCTIVE APPARATUS

Robert I. Van Nice, Sharon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 30, 1974, Ser. No. 474,851
Int. Cl.² H01F *15/14*
U.S. Cl. 336—70 **3 Claims**



1. An interleaved winding for electrical inductive apparatus, comprising:

at least first and second coil disks disposed axially adjacent to each other, said first coil disk containing an even number of turns of an electrical conductor, and said second coil disk containing an odd number of turns of an electrical conductor;

start-start connections which connect together and radially transpose the conductors of the first and second coil disks; and,

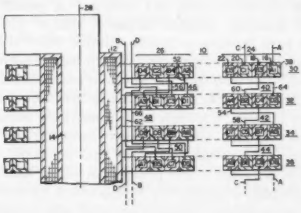
a finish-finish connection which connects together the outermost turn of the second coil disk to the turn of the first coil disk which is adjacent to the outermost turn of the first coil disk.

3,899,764

FOUR-STRAND INTERLEAVED-TURN TRANSFORMER WINDING

Robert I. Van Nice, Sharon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 16, 1974, Ser. No. 506,641
Int. Cl. H01f *15/14*
U.S. Cl. 336—70 **3 Claims**



1. An interleaved winding for electrical inductive apparatus, comprising:

at least first and second coil disks disposed axially adjacent to each other, with each coil disk containing a plurality of conductors spirally disposed around a common axis to form at least inner and outer turns of the conductors;

start-start and finish-finish connections located between the coil disks to provide at least first, second, third and fourth conduction paths through the coil disks, said conduction paths being directed in a first radial direction when progressing towards said axis and in a second radial direction when progressing away from said axis;

said first and second conduction paths beginning at the outer turn of the first coil disk and progressing in the first direction through the first coil disk and then in the second direction through the second coil disk;

said third and fourth conduction paths beginning at the inner turn of the second coil disk and progressing in the second direction through the second coil disk and then in the first direction through the first coil disk;

with said third conduction path being radially positioned, in the coil disks, between the first and second conduction paths;

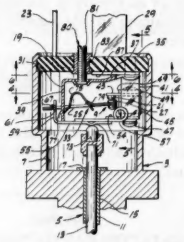
said first coil disk being connected to a third coil disk in the winding by a start-start connection which is positioned under the inner turn of the second coil disk, said third coil disk being axially located in the winding with two coil disks between the first and third coil disks.

3,899,765

THERMALLY ACTUATED SWITCH

Theodore J. Daigneault, Jr., Sheldonville, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 31, 1974, Ser. No. 493,283
Int. Cl.[2] H01H *37/74*
U.S. Cl. 337—386 **9 Claims**



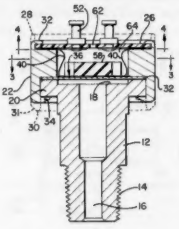
1. A thermally actuated snap-acting switch comprising a switch housing, thermal actuator means having a portion within said housing movable relative thereto in response to changes in temperature, and switch means within the housing actuatable by said thermal actuator means, said switch means comprising a stationary contact, a first terminal for said stationary contact, a switch arm, a movable contact carried by said switch arm, and a second terminal for said movable contact, said switch arm and said movable contact being movable between a first position in which said stationary and said movable contacts are in electrical contact with one another and a second position in which said contacts are spaced from one another for making and breaking an electrical circuit between said terminals, said switch means further comprising a switch frame secured to said housing and means for abruptly moving said switch arm and said movable contact from their first position to their second position when said thermal actuator portion moves into a position corresponding to a predetermined temperature, said means for abruptly moving said movable contact and said switch arm comprising spring means interposed between said switch arm and said switch frame for biasing said switch arm into one of its positions and for abruptly moving said switch arm between said positions in response to a predetermined amount of movement of said thermal actuator portion, and adjustable means for varying the temperature at which said movable contact and switch arm move abruptly over center from one position to another, said adjustable means comprising means for moving said switch frame and said spring means relative to said stationary contact.

3,899,766

PRESSURE TRANSDUCER

Seymour Mermelstein, Newton, Mass., assignor to Tyco Laboratories, Inc., Waltham, Mass.

Filed Mar. 29, 1974, Ser. No. 456,122
Int. Cl.[2] H01C *13/00;* **G01L** *1/18*
U.S. Cl. 338—42 **11 Claims**



1. A pressure transducer comprising a hollow case that is open at both ends and has an internal shoulder,

a diaphragm disposed in said case with one side of the peripheral portion of said diaphragm engaging said shoulder,

annular means engaging the other side of the peripheral portion of said diaphragm,

said case having a portion at one end that is bent over said annular means and forces said annular means to clamp said peripheral portion tightly against said shoulder, with a hermetic seal being formed at said shoulder between said diaphragm and said case,

a strain gage with at least one electrical resistance element bonded to one side of said diaphragm, and

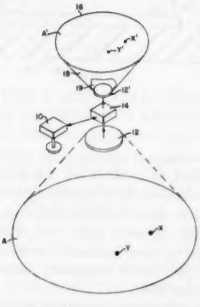
electrical termination means mounted to said case and electrically connected to said at least one electrical resistance element.

3,899,767

IMAGING SYSTEM

Charles H. Jones, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 15, 1973, Ser. No. 416,326
Int. Cl.[2] G01S *9/66, 7/56, 3/80*
U.S. Cl. 340—3 R **28 Claims**



1. An imaging system comprising:

A. a plurality of receiving elements for receiving energy from a target area to be viewed, for providing first output signals;

B. a plurality of transmitting elements for transmitting energy;

C. said receiving elements being arranged in a geometric array over a first predetermined surface;

D. said transmitting elements being arranged in a similar, scaled geometric array over a second predetermined surface;

E. said second predetermined surface being a similar scaled replica of said first predetermined surface;

F. output means for receiving and displaying the energy pattern from said transmitting elements;

G. signal processing means responsive to said first output signals and operable to process said first output signals to provide second output signals to said plurality of transmitting elements;

H. said processing being operable to change said first output signals such that the energy distribution at said output means is a scaled replica of the energy distribution from said target area under investigation.

3,899,768

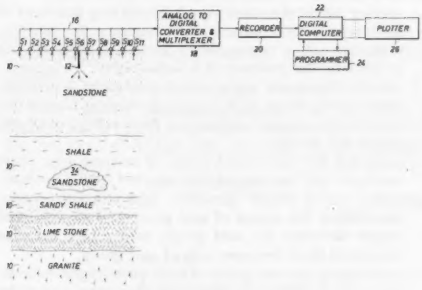
METHOD OF SEISMIC SURVEYING BY EXTRACTING AND DISPLAYING SEISMIC PROPERTIES

Roy Gibson Quay, and Clifford Harvey Ray, both of San Antonio, Tex., assignors to Petty-Ray Geophysical, Inc., Houston, Tex.

Continuation of Ser. No. 347,197, April 2, 1973, abandoned. This application July 11, 1973, Ser. No. 378,176

Int. Cl. G01v 1/24

U.S. Cl. 340—15.5 DS **47 Claims**



1. A method of seismic surveying comprising the steps of: obtaining a plurality of seismic signals each from different points along a traverse in a seismic survey;

generating a multi-channel seismic record of such seismic signals grouped in side-by-side format to represent a section of the geological structure of the earth beneath such traverse;

selecting multiple sets of laterally extending guidelines associated at least in part with the geologic structure represented on such seismic record;

extracting a seismic property from the data contained within zones associated with each of such guidelines;

establishing a reference axis that conforms with such guidelines; and

plotting a value proportional to the magnitude of such seismic property about such reference axis.

3,899,769

METHOD OF AND APPARATUS FOR REPRESENTING THE MOVEMENT OF A MOVING BODY IN A TWO-DIMENSIONAL SPACE

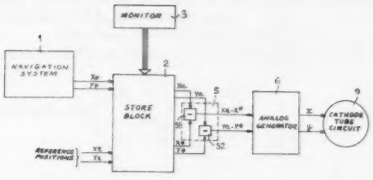
Etienne Augustin Henri Honore, Chatenay Malabry, France; Emile Leon Gabriel Torcheux, deceased, late of Paris, France; by Micheline Marie Torcheux, born Deloffre, heir, Paris, France; Alain Torcheux, heir, Paris, France, and Adeline Geret, born Torcheux, heir, Paris, France, assignors to Societe d'Etude et d'Application des Techniques Nouvelles NEO-TEC, France

Filed June 25, 1973, Ser. No. 373,555

Claims priority, application France, June 27, 1972, 72.23193

Int. Cl. G08c 21/00; G01s 7/22

U.S. Cl. 340—24 **9 Claims**



1. Method of representing the movement of a moving body on the screen of a cathode ray tube system having two spot-position control inputs, from a pair of items of information giving the current position of the moving body in a two-dimensional coordinate system, comprising the steps of:

a. storing a plurality of pairs of items of information giving the position of reference points, in the same two-dimensional coordinate system,

b. storing from time to time the pair of items of information giving the current position of the moving body, while eliminating the oldest stored pair, so as to keep in store only a limited number of such items of information,

c. sequentially reading each pair of items of position information in the group comprising the pairs of items of said stored information giving the positions of reference points, the pairs of items of said stored information giving the position of the moving body, and the pair of items of information giving the current position of the moving body,

d. sequentially subtracting each read pair of items of position information from a predetermined pair of items of information in said group, respectively, so as to obtain a pair of items of position information relative to the position corresponding to said predetermined pair,

e. sequentially converting at least parts of the two items of information of each successive pair of items of relative-position information, into a pair of analogue signals, respectively,

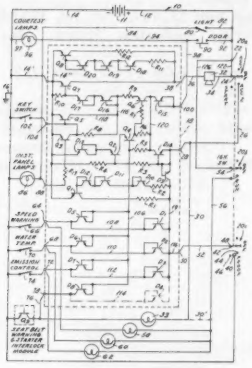
f. applying succession each pair of analogue signals respectively to the said two spot-position control inputs of the cathode ray tube system, and

g. selectively repeating said steps c) through f), thereby providing a representation of the current position and the past positions of the moving body and of the positions of the reference points.

3,899,770
MULTIPLE INPUT WARNING SYSTEM FOR A MOTOR VEHICLE

Kenneth G. Slotkowski, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 1, 1974, Ser. No. 457,511
Int. Cl.[2] B60Q 5/00; G08B 23/00
U.S. Cl. 340—52 F **10 Claims**



1. A multiple input warning system for a motor vehicle, said motor vehicle including:

a. a DC source of electrical potential;

b. first and second voltage supply leads connected to opposite terminals of said DC source of electrical potential;

c. a warning device electrically actuable upon the application of an electrical potential difference across its terminals;

d. a door on said vehicle;

e. a switch controlled by the opening and closing of said door, said switch being nonconductive when said door is closed and conductive is open; said door isopen;

f. an instrument panel lamp;

g. a light switch, coupled to said instrument panel lamp, for controlling the supply of electrical potential to said instrument panel lamp;

h. an ignition switch operated by the insertion in it of a key, said ignition switch including a key switch for sensing the presence of a key in said ignition switch, said key switch having a first state of conductivity when a key is in said ignition switch and a second state of conductivity in the absence of a key in said ignition switch, said ignition switch being connected to said first lead and having an electrical pole, said ignition switch having a condition wherein said first voltage supply lead is connected to said pole;

i. an indicating lamp; and

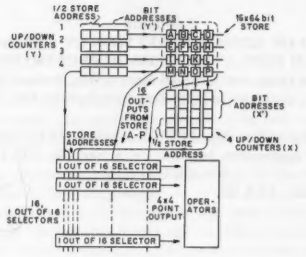
j. a switching device connected in series with said indicating lamp, a junction thereby being formed between said switching device and said indicating lamp, said series-connected indicating lamp and switching device being connected, through said ignition switch, across said first and second voltage supply leads when said ignition switch is in said condition; wherein the improvement comprises:

k. circuit means, coupled to said second voltage supply lead, to said pole of said ignition switch, to the junction formed between said series-connected indicating lamp and switching device, to said door switch, to said light switch, to said key switch and to said warning device, for applying an electrical potential, derived from said first and second voltage supply leads, across terminals of said warning device: when said key switch is in its first state of conductivity, said ignition switch is not in said condition and said door switch is closed; when said ignition switch is in said condition and said indicating lamp is energized; and when said instrument panel lamp is energized, said ignition switch is not in said condition and said door switch is closed.

3,899,771
METHOD OF CHARACTER RECOGNITION BY LINEAR TRAVERSE EMPLOYING SHIFTED EDGE LINES

Peter Saraga, and Peter Roy Wavish, both of Salfords, near Redhill, England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 281,344, Aug. 17, 1972, abandoned. This application June 17, 1974, Ser. No. 479,904
Claims priority, application United Kingdom, Aug. 17, 1971, 38528/71; Aug. 17, 1971, 38527/71; Mar. 1, 1972, 9488/72
Int. Cl. G06k 9/16
U.S. Cl. 340—146.3 AE **11 Claims**



1. A method of recognizing a character of varying stroke width comprising the steps of:

a. storing digital electrical signals identifying the shape of the character in a first matrix of storage cells whereby a character cell is distinguished from a background cell position by the presence of a digital signal;

b. sensing the digital signal characteristics of a predetermined group form of storage cells starting from a first predetermined group and sensing the condition of all cells within that group;

c. assigning for said sensed group of cells an appropriate operator, said operation being selected from a predetermined set of unique operators, said assigned operator establishing the center of said group and an associated vector direction for said group, said center being an interstitial point between cells of said group;

d. establishing the next group of cells whose digital information is to be sensed by employing the center and vector direction information of said first group of cells;

e. determining and storing in a second matrix a shifted edge line by repeated application of said sensing, assigning and establishing steps in a complete circuit of said character, said shifted line lying between the outermost character cell positions and adjacent background cell positions;

f. comparing said shifted edge line with a standard edge line in order to recognize the character.

3,899,772
MOBILE COMPUTER TERMINAL AND SYSTEM

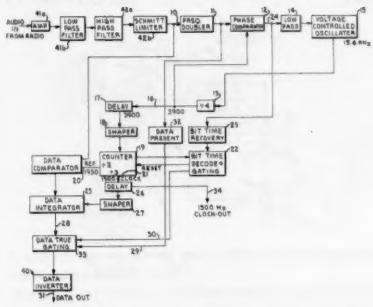
Alan B. Mead; John L. Aker; David A. Malan, all of Chanute, and John R. Alden, Olathe, all of Kans., assignors to Kustom Electronics, Inc., Chanute, Kans.

Filed Apr. 23, 1973, Ser. No. 353,509
Int. Cl. G06f 3/14
U.S. Cl. 340—152 **18 Claims**

1. In a mobile terminal computer system having a plurality of mobile terminal units, a base radio and a computer data base, the improvement comprising:

said mobile terminal unit including means for encoding, transmitting, receiving and decoding digital data

means for communicating said digital data between said terminal unit, said base radio and said computer data base thereby facilitating terminal unit dispatching, unit status updating and computer information retrieval without voice communication,



means for automatically transmitting an acknowledgement to said computer data base that digital data has been received by said mobile terminal unit, and

means for transmitting an operator acknowledgement to said computer data base that said digital data is received by said terminal unit operator.

3,899,773

REMOTE CONTROL SIGNAL GENERATOR WHICH OPERATES TO INDIVIDUALLY CONTROL A PLURALITY OF CONTROLLED CIRCUITS

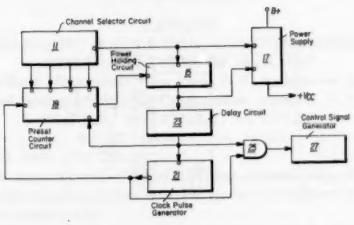
Seizo Yamauchi, and Kazuo Shimomura, both of Osaka, Japan, assignors to Sanyo Electric Company, Ltd., Osaka, Japan

Filed Feb. 9, 1973, Ser. No. 331,019

Claims priority, application Japan, Feb. 10, 1972, 47-14425; Feb. 10, 1972, 47-14426; Feb. 10, 1972, 47-14427; Feb. 10, 1972, 47-14428; Feb. 16, 1972, 47-16642; June 14, 1972, 47-59793

Int. Cl. H04q *5/00*

U.S. Cl. 340—167 R **19 Claims**



1. A remote control signal generator which operates in a manner so as to individually control a plurality of remote circuits comprising:

a. channel selector means including a plurality of selector switch means for producing a binary coded signal corresponding to a selected one of said selector switch means;

b. holding means actuated by said channel selector means;

c. clock pulse generating means, actuated by said holding means for generating a predetermined number of clock pulses;

d. power supply means coupled to said channel selector means and said holding means;

a. preset counting means coupled to said channel selector means such that the count set in said counting means corresponds to said binary coded signal, said counting means counting the number of pulses generated by said clock pulse generating means up to the count set by said channel selector means and providing a stopping signal to said holding means to control said clock pulse generating means when said preset count has been reached; and,

f. control signal generator means, coupled to said clock pulse generating means and synchronized with the pulses generated by said clock pulse generating means for generating remote control signals to control said plurality of remote circuits.

3,899,774

INTERROGATION OF REMOTE STATIONS

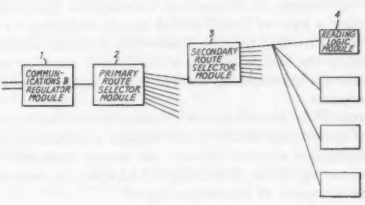
Alexander J. Binnie, Luton; Kenneth Bowdell, Shefford, and Philip James Clark, Luton, all of England, assignors to George Kent Ltd., Luton, England

Filed May 4, 1973, Ser. No. 357,111

Claims priority, application United Kingdom, May 4, 1972, 20785/72

Int. Cl.² H04Q *11/00*

U.S. Cl. 340—163 **6 Claims**



1. Apparatus for reading sources of information connected thereto and for transmitting information from the sources to a remote interrogator in response to an interrogation signal, containing coded instructions from the interrogator, comprising:

a data transmission line;

route selector means remote from the interrogator and connected to the interrogator by said data transmission line, said route selector means having an input terminal electrically connected to said transmission line and a plurality of output terminals, and being for establishing an electrical path, upon receiving a first coded interrogation signal via said transmission line from the interrogator, from said input terminal to a particular one of said plurality of output terminals as directed by the coded instructions in said first interrogation signal;

at least one reading circuit means electrically connected to each of said plurality of output terminals of said route selector means, each reading circuit means having input means electrically connected to a respective one of the sources of information, for reading said information from a respective one of the sources selected in response to a third coded interrogation signal upon receiving said third coded interrogation signal from said interrogator via said route selector means;

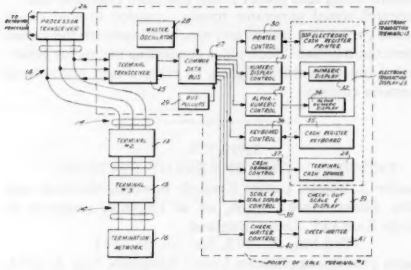
means for generating a coded signal representative of the information of the source in response to said third coded signal; and

coupling means independent of said route selector means for applying said generated coded signal to said transmission line.

3,899,775
AUTOMATIC STORE TRANSACTION SYSTEM AND TERMINAL THEREFOR

John M. Larsen, Bellflower, Calif., assignor to MSI Data Corporation, Costa Mesa, Calif.

Filed Apr. 13, 1973, Ser. No. 351,087
Int. Cl. G06f *15/20, 3/04*
U.S. Cl. 340—172.5 **14 Claims**



1. An automatic store transaction system comprising a digital computer having preselected, accessible transaction information recorded therein and capable of executing preselected operations on transaction information, the computer generating a train of binary coded signals including a unique signal for activating a single transaction terminal adapted to respond to the unique signal, a transceiver coupled to said computer for transmitting binary coded signals to and from the computer,

a terminal for recording store transactions including means for generating binary coded signals representative of a transaction entered therein and means responsive to a unique signal for activating the terminal in response to the reception of the unique signal,

a transceiver coupled to the terminal for transmitting binary coded signals to and from the terminal,

and

means coupled between said transceivers for transmitting the binary coded signals between the digital computer and the terminal, said means comprising a transmission line system having three transmission lines arranged in a balanced system, the store transactions entered into the terminal being represented by binary coded signals that are transmitted to the digital computer for processing once the terminal is activated in response to the unique signal and the processed data being transmitted back to the transaction terminal for completing the store transaction.

3,899,776
PROGRAMMABLE TERMINAL

John S. Sicko, Schenectady, N.Y.; Raymond J. Hodsoll, Jr., Salem, Va., and John T. Adamchick, Amsterdam, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 318,363, Dec. 26, 1972, abandoned.
This application Feb. 28, 1974, Ser. No. 446,636
Int. Cl.[2] G06F *3/00, 9/00*
U.S. Cl. 340—172.5 **12 Claims**

1. A programmable terminal for operating on-line or off-line to control or monitor a plurality of external devices comprising:

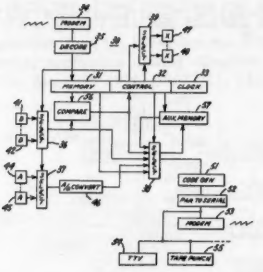
memory means for storing program and control information;

logic means coupled to said memory means and said external devices for converting information from said memory into control signals, said logic means including external selection means for selectively activating at least one of said external devices;

comparison means coupled to said memory means and said external devices for comparing incoming information with information from said memory means;

internal selection means, coupled to said memory means and said external devices, for selecting one of a plurality of internal signals for transmission from said terminal, said internal signals including said control signals and signals received from selectively activated external devices; and

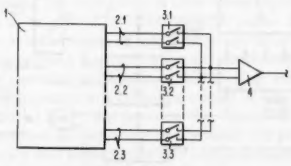
output means, coupled to said internal selection means, for providing an output signal from said terminal.



3,899,777
MEANS FOR EQUALIZING LINE POTENTIAL WHEN THE CONNECTING SWITCH IS OPEN

Erwin Feicht, Berlin; Werner Otto Haug, Boeblingen; Rolf Remshardt, Boeblingen, and Helmut Schettler, Boeblingen, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 25, 1974, Ser. No. 446,033
Claims priority, application Germany, Feb. 23, 1973, 2309186
Int. Cl.[2] G11C *7/06*
U.S. Cl. 340—173 R **5 Claims**



1. Storage arrangement comprising:

a read amplifier having input lines;

a plurality of separate read lines each connectable separately or in pairs to the input lines of said read amplifier;

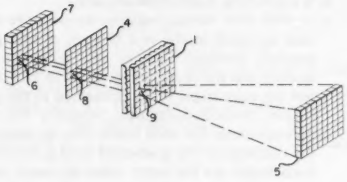
switch means connected between said input lines and said read lines; and

means connected between a source potential and both said input lines and said read lines for bringing both said input lines and said read lines to the same potential level when said switch means is open.

3,899,778
MEANS EMPLOYING A MULTIPLE LENS ARRAY FOR READING FROM A HIGH DENSITY OPTICAL MEMORY STORAGE

Donald L. Roberts, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 4, 1974, Ser. No. 430,932
Int. Cl.² G11C *13/04*; **G02B** *3/00*
U.S. Cl. 340—173 LM **14 Claims**



1. A system for retrieving information stored page-by page on a mask comprising:

A. illumination means, said illumination means including a plurality of discrete light emitting areas and means for selectively enabling said discrete areas for light emission;

B. a multiple lens array comprising first and second substrates each having parallel corrugations on a face thereof, said faces brought together with the parallel corrugations of said first substrate perpendicular to the parallel corrugations of said second substrate, said corrugations forming at each intersection thereof one of a plurality of lenslets, said multiple lens array being disposed proximate said illumination means such that each of said lenslets is aligned with one of said discrete light emitting areas; and

C. photosensitive detector means, said photosensitive detector means including a plurality of light sensitive areas, said photosensitive detector means being disposed to intercept light issued from a light emitting discrete area of said illumination means and passed through a corresponding lenslet of said multiple lens array;

whereby an information bearing area of a mask positioned intermediate said illumination means and said multiple lens array is illuminated by a selected light emitting area, and the resultant information encoded beam passes through the corresponding one of said lenslets and impinges on said photosensitive detector means.

3,899,779
MAGNETIC BUBBLE DOMAIN SYSTEM USING DIFFERENT TYPES OF DOMAINS

Alexis Plato Malozemoff, New York, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

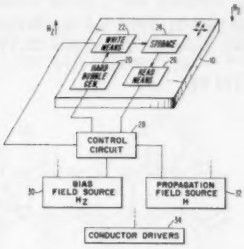
Filed June 29, 1973, Ser. No. 375,285
Int. Cl.² G11C *11/14*, *19/08*
U.S. Cl. 340—174 TF **14 Claims**

1. A magnetic information handling system using different types of magnetic bubble domains for representation of information, comprising:

a single layer of magnetic medium in which multi-state magnetic bubble domains can exist at the same time, said domains having different numbers of vertical Bloch lines in their domain walls, said information being represented by said multi-state domains and in particular by the number of vertical Bloch lines in said domains,

storage means for simultaneously storing domains having different numbers of vertical Bloch lines in said magnetic medium,

write means for producing information in said magnetic medium, said information being in the form of coded patterns of said multi-state domains, said write means including means for producing magnetic domains having different numbers of said vertical Bloch lines in their domain walls and further means for entering a pattern of coded information into said storage means,

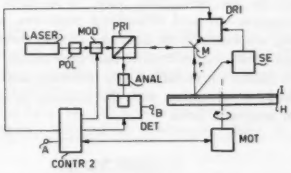


read means for reading said information contained in said storage means, said read means including further means for detecting the information state of said magnetic domains in accordance with the number of vertical Bloch lines in the walls of said domains.

3,899,780
MAGNETIC BUBBLE STORE HAVING OPTICAL CENTERING APPARATUS

Matti Niilo Tapani Otala, Oulu, Finland, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 30, 1974, Ser. No. 437,975
Claims priority, application Netherlands, Feb. 12, 1973, 7301929
Int. Cl.² G11C *13/06*, *11/14*
U.S. Cl. 340—174 YC **5 Claims**



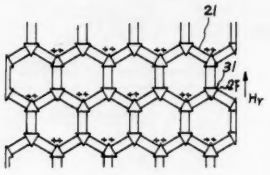
1. A storage system comprising a plate of magnetic material, said magnetic material being provided with a regular two-dimensional array of first recesses, said first recesses forming in cooperation with said magnetic material magnetically active elements for storing digital information in the form of magnetic bubbles, write means comprising an electromagnetic radiation source for locally heating the magnetically active elements whereby the magnetic bubbles are formed, means for maintaining a magnetic bias field in the vicinity of said magnetically active elements, the magnitude of the field determining the bubbles dimensions, electromagnetic read means for detecting said bubbles, addressing means for directing said read means and the said read write means to scan a selected magnetically active area, said plate being further provided with second recesses elongated in the direction in which said magnetically active areas are scanned, said second recesses forming a regular two-dimensional array with said first recesses, and optical centering means for directing electromagnetic radiation to said second recesses and for centering said plate with respect to said read means and said write means in response to said radiation from said second recesses.

3,899,781

MAGNETIC BUBBLE TRANSMISSION SYSTEM USING A ROTATING MAGNETIC FIELD

Teruji Watanabe, Niza, and Hideo Ishihara, Kamakura, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed June 21, 1974, Ser. No. 481,889
Claims priority, application Japan, June 22, 1973, 48-69900
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 TF **5 Claims**



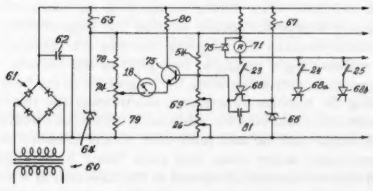
1. A magnetic bubble transmission system, comprising:
a magnetic thin plate for causing therein at least one magnetic bubble;
bias means for applying a bias magnetic field to said magnetic thin plate in a direction perpendicular to the surface thereof;
rotation means for applying a rotating magnetic field to said magnetic thin plate along the surface thereof;
a honeycomb soft magnetic thin film formed into substantially hexagonal patterns and disposed on said magnetic thin plate in close contact therewith;
direction specifying means of thin films coupled to said honeycomb soft magnetic thin film for giving priority order of the transmission direction of said magnetic bubble from each of branching positions of said honeycomb soft magnetic thin film positioned at each of vertex of each of said hexagonal patterns to three sides thereof contiguous to said branching positions, said thin films being disposed on at least one of said three sides; and
control means connected to said bias means and said rotation means for reducing and restoring said bias magnetic field in synchronism with the rotation cycle of said rotation magnetic field.

3,899,782

APPARATUS FOR MONITORING REACTION END POINT

Everett L. Miller, 339 W. Burnham St., Battle Creek, Mich. 49015, and Frank D. Miller, 609 Warwick Ave., Thousand Oaks, Calif. 91360

Filed Aug. 27, 1973, Ser. No. 391,672
Int. Cl. G08b *25/00*
U.S. Cl. 340—228 R **5 Claims**



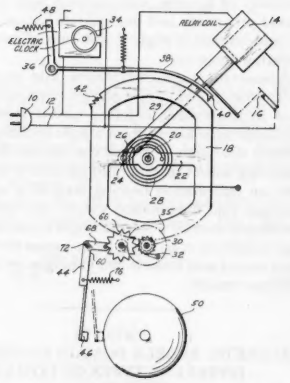
1. An apparatus for monitoring the course of a reaction carried out by heating reaction mixtures in a plurality of reaction kettles and sensing the attainment of a particular temperature by the reaction mixture in each kettle as indicative of a desired end point, said apparatus comprising:
1. means providing a direct current power supply,
2. an alarm circuit connected to said direct current comprising a common relay for all said kettles having alarm means connected to the contact points thereof,
3. a silicon controlled rectifier connected to the coil of said relay,
4. a probe mounted on the wall of each kettle
5. end point control means for each kettle connected across said direct current power supply comprising in series:
a. a potentiometer having a graduated scale on its dial,
b. a calibrating potentiometer, and
c. a solid state thermoresistive temperature sensing device mounted in the end of each of said probes, the junction between each of said temperature sensing devices and the corresponding one of said potentiometers for each kettle being connected to the gate of said silicon controlled rectifier, whereby the calibrating potentiometer for each kettle may be adjusted so that the readings on the graduated scale potentiometers for each kettle are the same when the same end point is reached by the reaction mixture in each kettle.

3,899,783

MECHANICAL ALARM SOUNDING FAILURE OF ELECTRICAL SYSTEM

Edward Kuzmar, and Mary Kuzmar, both of 4407 S. Campbell Ave., Chicago, Ill. 60632

Filed Aug. 15, 1973, Ser. No. 388,627
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—253 C **3 Claims**



1. A device for sounding an alarm when electrical power fails, said device comprising:
a flat oval shaped member having a central opening spanned by a cross piece, said member being freely rotatable about an axis extending at right angles through the center of the cross piece, said member having a prong which is parallel to said axis and is secured to said cross piece offset from the center;
an electric relay having a winding energized when said power is present and deenergized when said power fails, and a plunger pulled in when the winding is energized and pushed out when the winding is deenergized, said plunger having a longitudinal slot in its free end, said slot being engaged by said prong, movement of the plunger causing rotation of the member, whereby the member is rotated in one direction to a first position when the plunger is pulled in and is rotated in opposite direction to a second position when the plunger is pushed out;

a windup spring connected at one end to said member, said spring being wound up when the member is rotated from the first position to the second position and being free to unwind when the member is in the second position, said spring being prevented from unwinding when the member is in the first position; and

means including a gong and hammer, said means being actuated by said spring as it unwinds to cause the hammer to repeatedly strike and move away from the gong to sound the alarm.

3,899,784

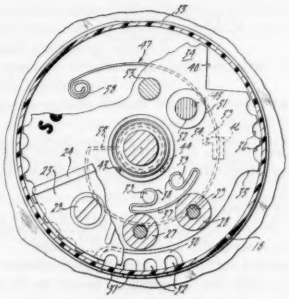
GLASS BREAKAGE DETECTOR

Vincent J. McHenry, Farmington, Mich., assignor to Omni Spectra, Inc., Farmington, Mich.

Filed May 17, 1973, Ser. No. 361,207

Int. Cl. G08b *13/08*

U.S. Cl. 340—274 R **20 Claims**



1. In a glass breakage detector, a sensing element, means securing said element to the inside surface of the glass, the element extending from said securing means, the shape of said element being such that movement of said securing means by the shock wave attendant only upon glass breakage will set said element into strong resonant vibration principally parallel to the plane of the glass, the shape of said element further being such that it is relatively immune to movement of said securing means by vibrations normal to the glass plane, and means connected to said sensing element and movable from a normal set position to a triggered position in which it initiates an alarm, said last-mentioned means being responsive to said vibrations of the sensing element parallel to the glass plane to move to its triggered position and thus initiate an alarm.

3,899,785

APPARATUS FOR CONTROLLING AND MONITORING THE OPERATION OF A LOAD DEVICE

Kurt Ryser, Langenthal, Switzerland, assignor to Greiner Electronic AG, Langenthal, Switzerland

Filed Dec. 28, 1973, Ser. No. 429,160

Claims priority, application Switzerland, Jan. 19, 1973, 753/73

Int. Cl. G08b *23/00*

U.S. Cl. 340—309.1 **9 Claims**

1. Apparatus for controlling and monitoring the operation of periodically operable load means (P), such as the dosage means of an automatic clinical analyzer, comprising

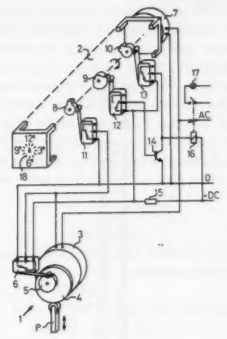
a. at least a first voltage source (AC);

b. normally de-energized load motor means (3) for driving said load means periodically between first and second positions;

c. means including an actuating switch (11) for initially connecting said load motor means with said first voltage source for a relatively brief initial period to initiate the operating cycle of said load means;

d. means including a holding switch (6) for subsequently connecting said load motor means with said first voltage source for a subsequent period of time, said holding switch means having a first condition when said load means is in the first position, and a second condition when said load means is displaced from said first position;

e. display means (17) having an initial state of energization; and



f. means including disconnect means (16) and monitor switch means (12, 13) responsive to the instantaneous condition of said holding switch for disconnecting said load motor means from said first voltage source and for operating said display means to the other state of energization in the event that said holding switch is not in its anticipated condition during any given period of the operating cycle of said load means.

3,899,786

LIQUID CRYSTAL COLOR DISPLAY SYSTEM

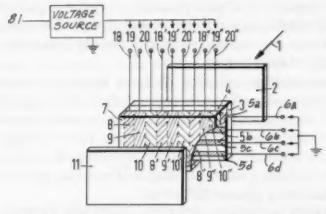
Waldemar Greubel; Hans Krueger, and Ulrich Wolff, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 16, 1973, Ser. No. 360,767

Claims priority, application Germany, June 2, 1972, 2226959

Int. Cl. G09f *9/32*

U.S. Cl. 340—336 **7 Claims**



1. In an apparatus for presenting colored images comprising:

a first light polarizing means,

a second light polarizing means,

a liquid crystal means mounted between first and second polarizing means,

electrode energizing means,

a plurality of transparent electrodes suitably mounted adjacent said crystal means such that said electrode energizing means produces a field across said liquid crystal wherein the improvement comprises an addition of at

least one pigment to the transparent electrode material whereby a colored image may be selectively derived.

3,899,787

TRIPLEX ANTENNA

Watson P. Czerwinski, Shrewsbury, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 18, 1974, Ser. No. 489,873
Int. Cl.[2] H01Q *9/04*
U.S. Cl. 343—790 **14 Claims**

1. A broadband antenna system for a plurality of radio apparatus adapted to operate simultaneously in the same frequency band, comprising in combination:

a generally vertically oriented electrically conductive and grounded support conduit of predetermined length;

a respective plurality of in-line tubular dipole radiating elements, one for each of said plural radio apparatus, axially mounted on said support conduit, the inner surface of said tubular radiating elements being grounded to said conduit substantially mid-way along their respective lengths;

a port in the sidewall of said support conduit at the location of each of said radiating element;

a respective coaxial cable, having an inner and outer conductor, coupling each radiating element to a respective radio apparatus of said plurality of radio apparatus, running through support conduit and out of a respective port, said outer conductor being electrically grounded in the vicinity of said port;

each said tubular radiating element having an opening to the outer wall surface thereof wherein the inner conductor of the respective coaxial cable passes therethrough and is electrically connected to said outer surface; and

respective impedance broadbanding means for each of said dipole radiating elements disposed exteriorally of each of said radiating elements.

3,899,788

LIGHT METERING SYSTEMS AND EXPOSURE CONTROL SYSTEMS FOR CAMERAS

Kenji Toyoda, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 5, 1974, Ser. No. 458,413
Claims priority, application Japan, Apr. 12, 1973, 48-40852
Int. Cl. G03b *7/08;* **G01j** *1/46;* **G03b** *17/18*
U.S. Cl. 354—23 D **23 Claims**

1. A light metering system comprising:

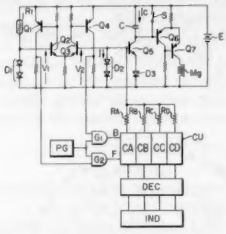
photoelectric means for producing a first analog signal which represents the intensity of light incident thereon;

a reversible counter;

converter means for producing a second analog signal which represents the count stored in said counter; and

counter control means for stepping said counter in a first direction when the difference between the first and second analog signals is greater than a predetermined value and for stepping said counter in the opposite direction when said difference is less than said predetermined value.

10. An automatic exposure control system comprising:



photoelectric means for producing a first analog signal which represents the brightness of an object to be photographed;

a reversible counter;

converter means for producing a second analog signal which represents the count in said counter;

counter control means for stepping said counter in a first direction when the difference between the first and second analog signals is greater than a predetermined value and for stepping said counter in the opposite direction when the difference between the analog signals is less than said predetermined value; and

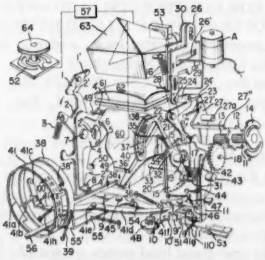
exposure control means for controlling exposure of film in a camera in accordance with the count in said counter.

3,899,789

EXPOSURE CONTROL SYSTEM IN A PHOTOGRAPHIC CAMERA

Tatsuya Taguchi, Tokyo; Takashi Uchiyama, Yokohama; Soichi Nakamoto, Machida, and Tadashi Ito, Yokohoma, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1973, Ser. No. 421,540
Claims priority, application Japan, Dec. 9, 1972, 47-123633
Int. Cl. G03b *7/08*
U.S. Cl. 354—30 **2 Claims**



1. An exposure control system in a single-lens reflex type photographic camera which comprises in combination:

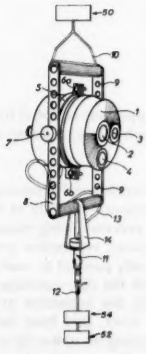
a. an interchangeable lens provided with an aperture preset device;
b. a light receiving means for metering light through the fully open aperture of said interchangeable lens;
c. a first exposure operating circuit;
d. a second exposure operating circuit;
e. an exposure control circuit including a storage circuit and an aperture information input element; and
f. an automatic aperture mechanism;
g. said first exposure operating circuit constituting means for controlling the automatic aperture mechanism in accordance with a preset exposure time and with the quantity of light from an object to be photographed received by said light receiving means to preset an aperture value and, simultaneously therwith, changing the value of said information input element so as to correspond to said aperture value;
h. said second exposure operating circuit constituting means for causing said storage to store an electrical quantity corresponding to said quantity of light from said object and for controlling the exposure time in accordance with the output of said storage circuit and the value of said information input element as set by said first exposure operating circuit:
i. said aperture information input element comprising a variable resistor, and
j. said entire system further including lock means for said automatic aperture mechanism, said lock means being adapted to lock said automatic aperture mechanism when said aperture preset device is manually operated, to thereby vary the resistance value of said variable resistor in accordance with the amount of rotation of an aperture preset member, whereby said second exposure operating circuit controls the exposure time.

3,899,790

APPARATUS FOR TAKING UNDERWATER PICTURES

Alain Pocachard, Marseille, France, assignor to Le Nickel; Centre National pour l'Exploitation des Oceans, both of Paris and Erji, Marseille, all of France, part interest to each

Filed Nov. 15, 1973, Ser. No. 415,986
Claims priority, application France, Nov. 15, 1972, 72.70458
Int. Cl. G03b *17/08*
U.S. Cl. 354—64 **4 Claims**



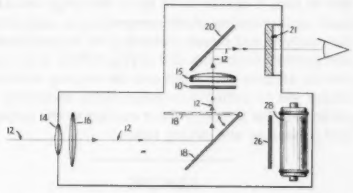
1. An apparatus for taking underwater pictures on making contact with the sea-bed, the apparatus comprising a sealed casing provided with at least one window; camera means and a flash generator housed within the casing; a framework on which the casing is adjustably mounted; means for connecting the framework to a float and means for detachably connecting the framework to ballast; electromagnetic triggering means arranged between the float and the ballast to close an electric circuit when contact is made with the sea-bed; an electromagnetic control device arranged within the sealed casing to actuate the camera means and the flash generator on closing of said electrical circuit; and an electric cable which provides a sealed connection between the electromagnetic triggering means and the electromagnetic control device; wherein said framework is provided with two parallel upright members which are formed with series of aligned holes, and said casing is clamped in a collar secured on the framework by transverse screws which extend through two aligned holes of said series; wherein said framework includes a tubular member through which a cable extends to connect the framework to the float; wherein said sealed casing comprises two windows, one facing the object lens of the camera means and the other facing the flash generator; and wherein each of the said windows has a frustoconical part in mating engagement with a corresponding frustoconical part of said casing, and a toroidal sealing joint is interposed between the two frustoconical parts.

3,899,791

PHOTOGRAPHIC POSITIONING AND ALIGNING GRID

Maximilian Kerr, Sea Girt, N.J., assignor to Maximilian Kerr Associates, Inc., New York, N.Y.

Filed Feb. 9, 1973, Ser. No. 331,314
Int. Cl. G03b *19/12*
U.S. Cl. 354—155 **13 Claims**



1. In a single lens reflex camera having a focal plane, a pivotable mirror for selectively and and alternately directing light to the camera film and to the said viewfinder focal plane, the improvement comprising means mounted on said viewfinder focal plane, said means having a plurality of markings thereon for dividing said viewfinder focal plane into one or more viewable areas, said viewfinder focal plane being mounted intermediate of the said eyepiece and a camera lens, said means and the film plane being substantially equidistant from said pivotable mirror, said means being precisely sized to a selected exposable area of the film in said camera, said plurality of markings precisely correlating the location of a subject in said viewfinder to the selected exposable area of the film whereby the precise location of the image on the film is controlled.

3,899,792

COPY SHEET DRYING AND DELIVERING DEVICE FOR REPROGRAPHIC MACHINE

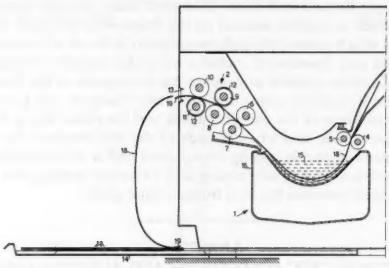
Giovanni Ravera, and Giorgio Siletto, both of Turin, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea(Turin), Italy

Filed May 24, 1974, Ser. No. 473,115
Claims priority, application Italy, June 12, 1973, 25089/73
Int. Cl.² G03D *3/08*; **G03B** *27/32, 27/52*
U.S. Cl. 354—320 **5 Claims**

1. In a reprographic machine of the liquid developing type having a liquid developing station and a copy sheet accumulating plane for receiving copy sheets discharged from the machine, a copy sheet drying and delivering device comprising:

a pair of squeezing rollers receptive of a copy sheet from the developing station for squeezing same;

means receptive of the copy sheet for drying same comprising a plurality of pairs of drying rollers, at least one drying roller of each pair having the outer surface thereof covered by a layer of liquid absorbent material; and



means for guiding the copy sheet from the developing station to turn it upside down upon discharge onto the copy sheet accumulating plane comprising an output slit from the machine and means mounting the longitudinal axes of said pairs of squeezing and drying rollers in an ascending convex arcuate path from said developing station to said output slit to define a corresponding ascending arcuate guide path for the copy sheet carried to the output slit by said squeezing and drying rollers.

3,899,793

INTEGRATED CIRCUIT WITH CARRIER KILLER SELECTIVELY DIFFUSED THEREIN AND METHOD OF MAKING SAME

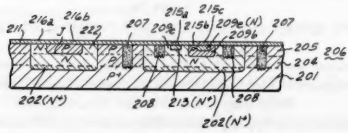
Kinji Wakamiya, Tokyo, and Isamu Kobayashi, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 233,673, March 10, 1972, Pat. No. 3,775,196, which is a division of Ser. No. 852,819, Aug. 25, 1969, Pat. No. 3,694,276. This application June 25, 1973, Ser. No. 373,604

Claims priority, application Japan, Aug. 24, 1968, 43-60713; Aug. 24, 1968, 43-60714

Int. Cl. H01l *19/00*

U.S. Cl. 357—48 **2 Claims**



2. A semiconductor device having a plurality of active circuit elements therein comprising a semiconductor substrate of one conductivity type, a plurality of islands of the opposite conductivity type formed in one face thereof, a first monocrystalline epitaxial layer formed on said one face of said substrate, a second monocrystalline epitaxial layer formed on said first epitaxial layer, an active circuit element formed in said epitaxial layers, a first polycrystalline ring in said second epitaxial layer around and spaced from at least a portion of said active circuit element, a second polycrystalline ring around and spaced from said first ring extending in depth from the outer face of said second epitaxial layer through both epitaxial layers to said substrate, said first polycrystalline ring having diffused therein a carrier killer which is out diffused into adjacent monocrystalline regions which form at least a part of said active elements.

3,899,794

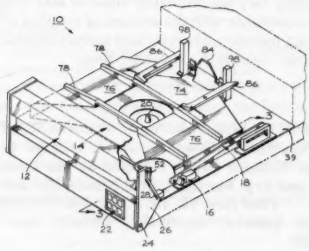
FRONT LOADING DISC DRIVE APPARATUS

Leon Henry Brown, Jr., Sylmar, Calif., assignor to Wangco Incorporated, Los Angeles, Calif.

Filed Nov. 30, 1973, Ser. No. 420,664

Int. Cl. G11b *23/04; 17/22*

U.S. Cl. 360—133 **18 Claims**



1. In disc drive apparatus adapted for receiving a standard disc cartridge through a front loading door, the combination comprising:

a frame;

a receiver for accepting and retaining the disc cartridge in a generally horizontal attitude at a first level relative to the frame, the receiver being mounted on the frame for movement between respective extended and retracted positions generally parallel to each other;

a base upon which the disc cartridge is to be mounted for operation within the apparatus at a second level lower than said first level, said base being connected to the frame and including an upwardly extending drive spindle upon which the disc cartridge is to be centrally engaged;

a front panel loading door pivotably joined to the frame for rotation about a pivot axis located near the lower forward edge of the door; and

actuating means coupled between the frame, the door, and the receiver for moving the receiver in two orthogonal directions between the extended position at the first level

and the retracted position at the second level in response to movement between respective open and closed positions of the loading door.

3,899,795

CASETTE TAPE RECORDING AND/OR REPRODUCING APPARATUS HAVING MOLDED CHASSIS AND MOLDED HEAD CARRIAGE

Kunitake Watanabe, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

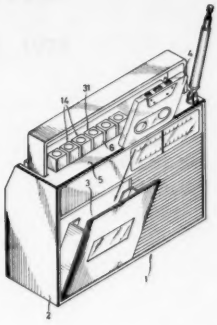
Filed May 21, 1973, Ser. No. 362,163

Claims priority, application Japan, May 22, 1972, 47-59635

Int. Cl.[2] G11B *1/00, 5/105, 15/04, 21/02*

U.S. Cl. 360—137 **19 Claims**

1. In a tape recording and/or reproducing apparatus having a tape driving mechanism that includes reel shafts for engagement with tape supply and take-up reels, a capstan and a motor for driving the reel shafts and capstan, and a magnetic head for selectively recording and/or reproducing signals on the tape as the latter is transported between the supply an take-up reels by means of the capstan; a main molded chassis of synthetic resin having said tape driving mechanism mounted thereon, and a molded carriage of synthetic resin having at least said magnetic head fixed thereon and being slidably mounted on said main molded chassis for selectively



disposing said head in an operative position in respect of the tape between the supply and take-up reels.

DESIGN PATENTS

GRANTED AUGUST 12, 1975

ERRATA

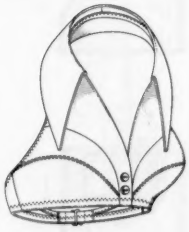
See CLASS	See PATENT NO.
027–042	236,280

DESIGNS

AUGUST 12, 1975

236,242
COMBINED DICKEY AND BRA
Harry W. Froehlich, 1344 Marineie Road, Pacific Palisades, Calif. 90272
Filed Apr. 12, 1974, Ser. No. 460,505
Term of patent 3½ years
Int. Cl. D2—*02*
U.S. Cl. D2—211

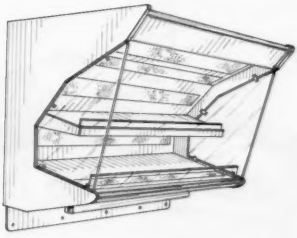
236,243
HALTER
Harry W. Froehlich, 1344 Marineie Road, Pacific Palisades, Calif. 90272
Filed Apr. 12, 1974, Ser. No. 460,504
Term of patent 3½ years
Int. Cl. D2—*02*
U.S. Cl. D2—353



236,244
STEP STOOL
Ralph B. Lay, Columbus, Ind. 47201
(% Hamilton Cosco Inc., 2525 State St., Columbus, Ind.)
Filed Nov. 12, 1973, Ser. No. 414,895
Term of patent 14 years
Int. Cl. D6—*01;* D6—*99*
U.S. Cl. D6—35

236,245
LETTER HOLDER
Donald R. Fude, and Vilas A. Fude, Rt. #1, Ripon, Wis. 54971
Filed Oct. 31, 1973, Ser. No. 411,479
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D6—114

236,246
AUXILIARY DISPLAY CASE
William H. Fredrick, North Hollywood, Calif., assignor of a fractional part interest to Nathan-Gilbert
Filed Nov. 9, 1973, Ser. No. 414,320
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—130



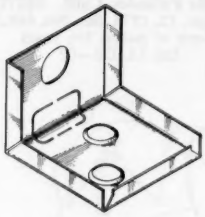
236,247
BARBECUE
Leo Michel, Toronto, Ontario, Canada, assignor to Diwalt Industries Limited, Toronto, Ontario, Canada
Filed Jan. 14, 1974, Ser. No. 433,139
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—107

236,248
SCISSORS
Lee S. Wolff, 500 N. 3rd St., Marquette, Mich. 49855
Filed June 5, 1974, Ser. No. 476,697
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57

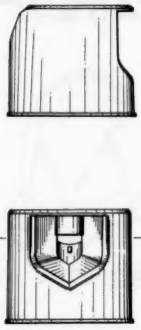
236,249
LUGGAGE HANDLE
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Airway Industries, Inc., West Pittsburgh, Pa.
Filed Jan. 9, 1974, Ser. No. 431,891
Term of patent 3½ years
Int. Cl. D8—*06*
U.S. Cl. D8—154

236,250
GROUND PLATE FOR A SHEATHED, ELECTRIC SURFACE UNIT
Frank T. Walton, 656 13th St., Oakmont, Pa. 15139
Filed Apr. 5, 1974, Ser. No. 439,223
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—229

236,251
BRACKET FOR A TERMINAL HOUSING OF AN ELECTRIC STRIP HEATER
Donald M. Cunningham, 2507 Greensburg Pike, Pittsburgh, Pa. 15221
Filed Apr. 5, 1974, Ser. No. 439,224
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—230

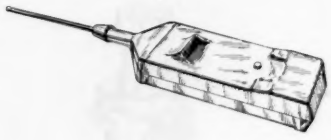


236,252
OVERCAP FOR A PRESSURIZED CONTAINER
James J. Sette, Morristown, N.J.
(% Design Molded Products, 879 Rahway Ave., Union, N.J. 07083)
Filed Mar. 4, 1974, Ser. No. 447,565
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—258



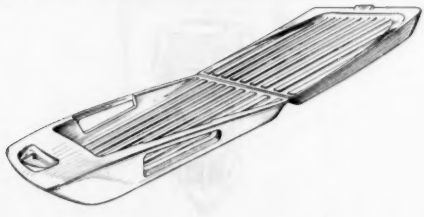
236,253
DIGITAL THERMOMETER
Robert Parker, Danville, Calif., assignor to RPR, Inc., Dublin, Calif.
Filed Sept. 13, 1973, Ser. No. 397,204
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57

236,254
ELECTRONIC THERMOMETER
Phillip E. Ray, 4080 W. 66th St., Arvada, Colo. 80003
Filed Oct. 3, 1973, Ser. No. 403,157
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57

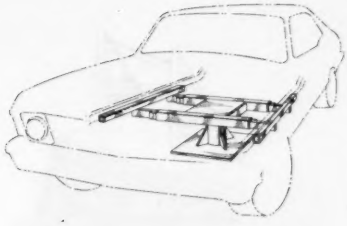


236,255
ELECTRICAL SHORT CIRCUIT TESTER
Raymond P. Smith, Jr., Williamsport, Pa., assignor to Craftmaster, Inc., Williamsport, Pa.
Filed Oct. 30, 1973, Ser. No. 411,138
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78

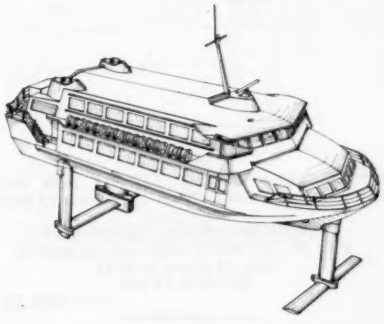
236,256
FOLDING SLED
Werner Hellman, 716 12th St., Baraboo, Wis. 53913
Filed Sept. 24, 1973, Ser. No. 400,333
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—11



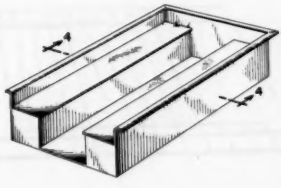
236,257
VEHICLE DISPLAY PORTABLE TURNTABLE
Norman F. Ficke, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed July 12, 1973, Ser. No. 378,650
Term of patent 3½ years
Int. Cl. D12—*05*
U.S. Cl. D12—55



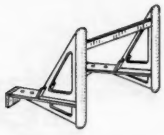
236,258
HYDROFOIL CRAFT
Charles S. Coffey, Mercer Island, and John J. Olson, Seattle, Wash., assignors to The Boeing Company
Filed Nov. 8, 1973, Ser. No. 414,068
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—66



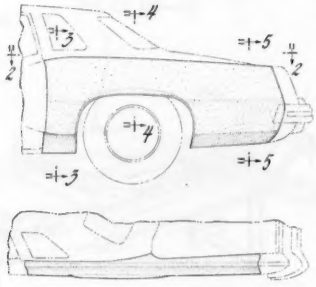
236,259
PICKUP TRUCK LINER
Irvin V. Hefner, 1429 Huron St., Metarie, La. 70005
Filed Oct. 29, 1973, Ser. No. 410,460
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



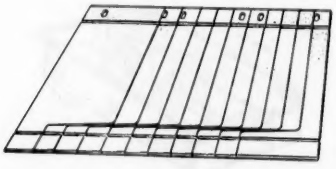
236,260
VEHICLE ATTACHED PUSH BUMPER
John H. Allmand, 21253 Woodhill Drive, Farmington Township, Mich. 48024
Filed Sept. 21, 1973, Ser. No. 399,414
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169



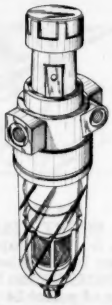
236,261
REAR FENDER FOR AN AUTOMOBILE
Gordon M. Brown, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 29, 1973, Ser. No. 392,423
Term of patent 3½ years
Int. Cl. D12—*08*
U.S. Cl. D12—196



236,262
POCKETED LEAF FOLDER
Arne G. Fredriksson, Sabbatsvagen 3, S–175 40 Jarfalla, Sweden
Filed Sept. 19, 1973, Ser. No. 399,251
Claims priority, application Sweden Mar. 27, 1973
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—33



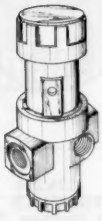
236,263
COMBINED FILTER AND REGULATOR FOR PRESSURIZED FLUID
Claude J. Dussardier, Littleton, and John G. Pousma, Denver, Colo., assignors to C. A. Norgren Co., Littleton, Colo.
Filed Oct. 4, 1973, Ser. No. 403,544
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—04



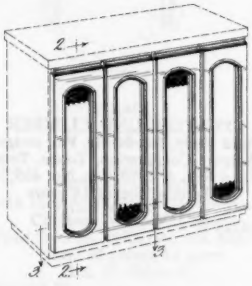
236,264
LUBRICATOR FOR PRESSURIZED FLUID
John C. Taylor, Denver, Colo., assignor to C. A. Norgren Co., Littleton, Colo.
Filed Oct. 4, 1973, Ser. No. 403,546
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3

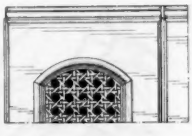
236,265
FILTER FOR PRESSURIZED FLUID
Claude J. Dussardier, Littleton, Colo, assignor to C. A. Norgren Co., Littleton, Colo.
Filed Oct. 4, 1973, Ser. No. 403,545
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

236,266
REGULATOR FOR PRESSURIZED FLUID
Clair Dean Holben, Denver, Colo., assignor to C. A. Norgren Co., Littleton, Colo.
Filed Oct. 4, 1973, Ser. No. 403,547
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—21

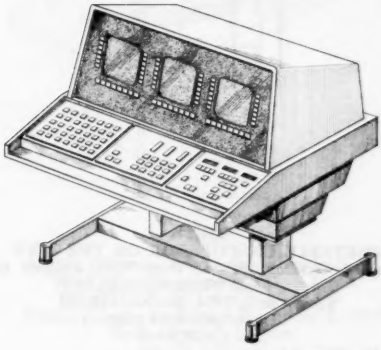


236,267
FACADE FOR AN ELECTRIC HUMIDIFIER
Ronald B. Kemnitzer, East Lansing, Mich., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Jan. 10, 1974, Ser. No. 432,413
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—146

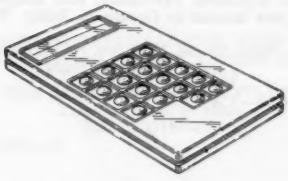




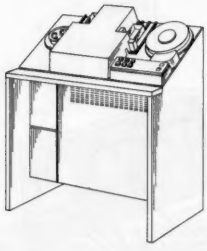
236,268
CONTROL AND DISPLAY CONSOLE
Renzo Dallimonti, Ambler, Pa., and Samuel Joseph Levinson, Cherry Hill, N.J., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Aug. 16, 1973, Ser. No. 388,950
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



236,269
CASE FOR AN ELECTRONIC CALCULATOR
Robert Li Shu-Keung, 108 Robinson Road, 8th Floor, Hong Kong
Filed Jan. 23, 1974, Ser. No. 435,945
Claims priority, Great Britain Oct. 29, 1973
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C



236,270
TICKET ENCODER FOR DATA PROCESSING
Wayne L. Aderman, Zumbro Falls, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 13, 1974, Ser. No. 450,645
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

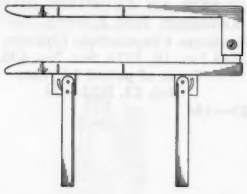


236,271
PORTABLE CALCULATOR OR THE LIKE
Andrew Herczog, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Apr. 8, 1974, Ser. No. 458,649
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

236,272
CHRISTMAS TREE
Vincent J. Aquilante, Providence, R.I., assignor of fractional part interest to George E. Reilly, Woonsocket, R.I.
Filed Jan. 28, 1974, Ser. No. 437,485
Term of patent 7 years
Int. Cl. D11—*02*
U.S. Cl. D29—1 A

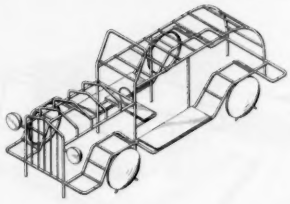
236,273
HAY FEED BUNK FOR CATTLE
Leonard R. Peak, Lacona, Iowa 50139
Filed Aug. 17, 1973, Ser. No. 389,389
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

236,274
GOLF PRACTICE DEVICE
Douglas M. Ford, 3 Hartman Place, Tuckahoe, N.Y. 10707, and Richard C. Schluter, 2420 Newton St., Vienna, Va. 22180
Filed Dec. 10, 1973, Ser. No. 423,230
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D34—5 GC

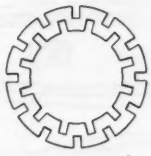


236,275
PLAYGROUND CLIMBER
Richard Rudy, Reedsville, Pa., assignor to Kilgore Corporation, Toone, Tenn.
Filed Feb. 4, 1974, Ser. No. 439,247
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 H

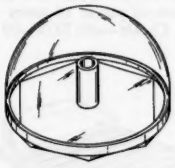
236,276
ANTIQUE CAR PLAYGROUND CLIMBER
Richard Rudy, Reedsville, Pa., assignor to Kilgore Corporation, Toone, Tenn.
Filed Apr. 15, 1974, Ser. No. 461,239
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 H



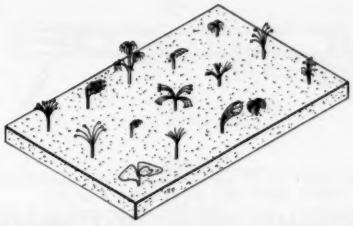
236,277
TOY CONSTRUCTION PIECE
Jack G. McAllister, 2701 N. Douglas Drive, 55422, and Richard O. Bartz, 7017 Mark Terrace Drive, 55435, both of Minneapolis, Minn.
Filed Feb. 12, 1973, Ser. No. 331,503
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 GG



236,278
SPINNING TOY
Kenneth Jack McPhail, 33 Meadowlea Road, Chatham, Ontario, Canada
Filed Dec. 19, 1973, Ser. No. 426,304
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 W

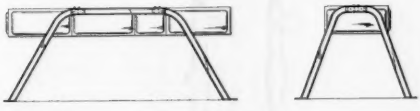


236,279
LIGHT EMMITTING OPTICAL FIBRE DISPLAY
Dennis K. Bingaman, R.D. #1, Dalmatia, Pa. 17017
Filed Sept. 7, 1972, Ser. No. 276,884
Term of patent 14 years
Int. Cl. 26—*05*
U.S. Cl. D48—20 C

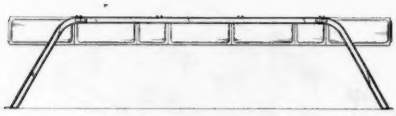


236,280
LIGHTER
Yoichi Ohsawa, Tokyo, Japan, assignor to Win Lighter Corporation, Tokyo, Japan
Filed July 9, 1973, Ser. No. 377,599
Claims priority, application Japan May 2, 1973
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

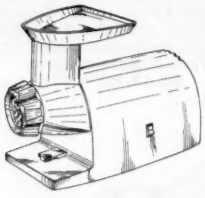
236,281
FRAME FOR OVERHEAD CAR WASH UNIT
Daniel C. Hanna, 1133 SW. Rivington Drive, Portland, Oreg. 97201
Filed June 14, 1974, Ser. No. 479,308
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D49—12



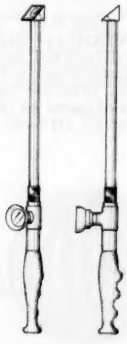
236,282
FRAME FOR OVERHEAD CAR WASH
Daniel C. Hanna, 1133 SW. Rivington Drive, Portland, Oreg. 97201
Filed June 14, 1974, Ser. No. 479,309
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D49—12



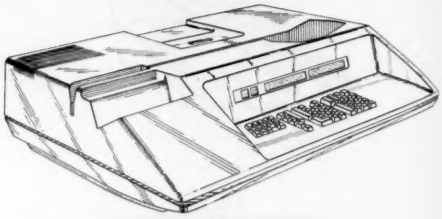
236,283
ELECTRICALLY POWERED MEAT GRINDER
Daniel E. McCue, Santa Barbara, Calif., assignor to Rival Manufacturing Company, Kansas City, Mo.
Filed Dec. 3, 1973, Ser. No. 420,949
Term of patent 14 years
Int. Cl. D7—*04;* D15—*08*
U.S. Cl. D55—1 B



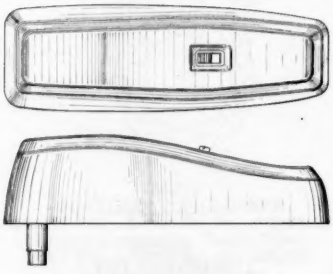
236,284
PORTABLE PERISCOPE
George E. Miller, 415 Costa Rica, San Mateo, Calif. 94402
Filed May 7, 1973, Ser. No. 358,249
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E



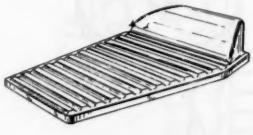
236,285
CASE FOR A CHECK ENCODER
James W. Jacobson, St.-Nom-La-Breteche, France, and Richard G. Clayton, Detroit, and Jerry J. Sims, Southfield, Mich., assignors to Burroughs Corporation, Detroit, Mich.
Filed Sept. 7, 1973, Ser. No. 395,234
Claims priority, application France Aug. 30, 1973
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D64—11 C



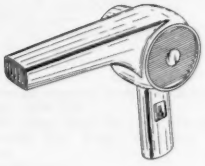
236,286
HAND HELD POWER UNIT FOR MASSAGING DEVICES
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.
Filed Oct. 24, 1973, Ser. No. 409,281
Term of patent 14 years
Int. Cl. D24—*99;* D28—*03*
U.S. Cl. D83—1



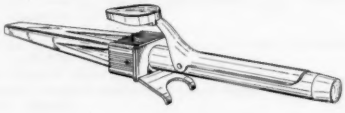
236,287
ELECTRICAL VIBRATING BACK MASSAGER
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.
Filed Mar. 13, 1974, Ser. No. 450,821
Term of patent 14 years
Int. Cl. D6—*09;* D28—*03*
U.S. Cl. D83—1 S



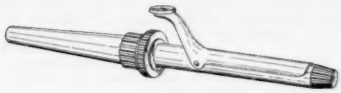
236,288
MANUALLY HELD ELECTRIC HAIR DRYER
Samuel L. McNair, and Henry J. Talge, Overland, Park, Kans., assignors to Dazey Products Co., Kansas City, Mo.
Filed Mar. 4, 1974, Ser. No. 448,014
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



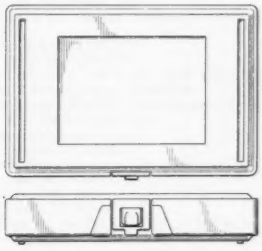
236,289
ELECTRIC HAIR CURLING IRON
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.
Filed Apr. 5, 1974, Ser. No. 458,245
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 E



236,290
ELECTRIC HAIR CURLING IRON
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.
Filed Apr. 25, 1974, Ser. No. 463,863
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 E



236,291
STORAGE AND CARRYING CASE FOR VIDEO TAPE CASSETTES OR THE LIKE
Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.
Filed Jun. 25, 1973, Ser. No. 373,472
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—10



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF AUGUST, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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AB Inventing: *See*—
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AB Modern Modell: *See*—
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AB Pellerin/Zenith: *See*—
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Abe, Satoshi: *See*—
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Aber, Henry S.; Riggs, Dean D.; and Lamantia, John, to Water Technology Service, Inc. Water treatment device. 3,899,410, Cl. 204-302.000.

Abex Corporation: *See*—
Adams, Cecil E.; Born, Ellis H.; and Smith, Gary C., Jr., 3,898,917.
Huntress, Howard B.; and Novotny, Raymond J., 3,899,054.

Abram, Stewart J.; Denis, David R.; Heinze, Alex E.; Johnson, Leonard M.; and Taylor, Edward, to R. R. Donnelley & Sons Co. Signature collating and binding system. 3,899,165, Cl. 270-54.000.

Accornero, Louis: *See*—
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ACF Industries, Incorporated: *See*—
Korte, Alfred C., 3,899,551.

Ackeret, Peter, to IDN Inventions and Development of Novelties AG. Container for tape cassettes. 3,899,229, Cl. 312-319.000.

Acme-Cleveland Corporation: *See*—
Langne, Bengt I., 3,899,019.

Acme Highway Products Corporation: *See*—
Kerschner, James J., 3,899,260.

Adachi, Tetsuro: *See*—
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Adams, Cecil E.; Born, Ellis H.; and Smith, Gary C., Jr., to Abex Corporation. Variable displacement fluid translating device. 3,898,917, Cl. 91-488.000.

Adcock, J. O.: *See*—
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Agback, Karl Hubert: *See*—
Swanbeck, Gunnar P. E.; Zetterberg, Gosta L.; and Agback, Karl Hubert, 3,899,591.

Agusti, Agustin, to J. Uriach & Cia S.A. Triamcinolone acetonide derivative. 3,899,581, Cl. 424-241.000.

Ahrens, James R.: *See*—
Tonnelli, Gerald J.; Epiling, Karol E.; and Ahrens, James R., 3,899,024.

Aichinger, Dietmar, to Albert Obrist & Co. Plastic closure cap for a container. 3,899,097, Cl. 215-253.000.

Aincough, Anthony Norbert: *See*—
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Air Products and Chemicals, Inc.: *See*—
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Airey, Harold Edwin: *See*—
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Aker, John L.: *See*—
Mead, Alan B.; Aker, John L.; Malan, David A.; and Alden, John R., 3,899,772.

Alaimo, Robert J.; and Goldenberg, Marvin M., to Morton-Norwich Products, Inc. 2-(p-Phenylazoanilino)quinolizinium bromide. 3,899,479, Cl. 260-156.000.

Alaimo, Robert J.; and Storrin, Ronald J., to Morton-Norwich Products, Inc. Process for preparing 2-(2′)-furyl-, 2-(2′)-thienyl- 2-(4′)-thiazolyl- or 2-(2′)-pyrryl-5 (or 6) nitrobenzimidazole. 3,899,503, Cl. 260-302.00H.

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Alexander, Donald R. Die embossing apparatus. 3,898,925, Cl. 101-18.000.

Alexandrov, Alexander Damyanov; Trifonov, Todor Kostov; Stefanov, Stefan Ivanov; Apostolov, Paskal Spasov; and Deshev, Mincho Borislavov, to Nipki "Leyarska Technika". Machine for casting metals under gas pressure. 3,899,021, Cl. 164-306.000.

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Allard, Frank L., to United States of America, Navy. Integrated circuit test clamp. 3,899,239, Cl. 339-255.00P.

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Allen, Jan K., to Caterpillar Tractor Co. Anti-tipping log skidder. 3,899,093, Cl. 214-85.500.

Alley, Robert P., to Construction Materials Division General Electric Company. Retrofit emergency lighting package. 3,899,632, Cl. 174-52.00R.

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Alps Electric Co., Ltd.: *See*—
Murata, Taneo, 3,899,648.

Altemore, Joseph M.; and Ort, Morris R., to Monsanto Company. Polymerization of ethylene. 3,899,477, Cl. 260-94.90B.

Aluma Building Systems Incorporated: *See*—
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Amagi, Yasuo; and Yusa, Haruhiko, to Kureha Kogaku Kogyo Kabushiki Kaisha. Process for preparing vinyl chloride compositions containing butadiene and butadiene-styrene copolymers. 3,899,547, Cl. 260-876.00R.

Ambrozetes, James P.; and Diehl, Homer R., to American Biltrite Inc. Merchandise packaging and display device. 3,899,078, Cl. 206-491.000.

Amerace Corporation: *See*—
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American Air Filter Company, Inc.: *See*—
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AMF Incorporated: *See*—
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Amick, James L. Wind-launched sailplane. 3,899,146, Cl. 244-16.000.

AMP Incorporated: *See—*
Yeager, Marvin Leo; Henschen, Homer Ernst; and Harwood, Robert George, 3,899,234.

Ancker-Johnson, Betsy, to Boeing Company, The. Detector-modulator for an optical communications system. 3,899,430, Cl. 250-199.000.

Anderson, Eric C. Treatment of emphysema, polyarthritis syndrome and pectin related diseases in ruminants. 3,899,579, Cl. 424-128.000.

Andersson, Benkt Reino: *See—*
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Andersson, Bror Gustav; and Andersson, Benkt Reino. Condenser for condensing a refrigerant. 3,898,867, Cl. 62-507.000.

Andrako, Thomas E., to Addressograph-Multigraph Corporation. Toner replenisher. 3,898,956, Cl. 118-637.000.

Andrews, Richard E.; Desmond, John D.; and Hart, Joseph J., to Container Corporation of America. Flip top carton. 3,899,125, Cl. 229-44.0CB.

Angier, Derek J.: *See—*
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Antipov, Igor, to International Business Machines Corporation. Method for forming a field effect device. 3,899,373, Cl. 148-187.000.

Aono, Shigeo; and Mizuguchi, Norio, to Nissan Motor Company Limited. Engine ignition timing control. 3,898,894, Cl. 74-866.000.

Aoshima, Yasuo: *See—*
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Ariga, Hajime, to Nissan Motor Company Limited. Power plant. 3,898,794, Cl. 60-39.18R.

Arild, Tor; and Gehres, Thomas. Hickey picking device for letter press or offset printing presses. 3,898,929, Cl. 101-147.000.

Armarco Marketing Company Inc.: *See—*
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Arnaud, Jacques Alexis; and Marcatili, Enrique Alfredo Jose, to Bell Telephone Laboratories, Incorporated. Slab-coupled optical waveguide. 3,899,235, Cl. 350-96.0WG.

Arrowhead Puritas Waters, Inc.: *See—*
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Arteche Instrumentacion Y Sistemas Electronicos, S.A.: *See—*
Gomez Llona, Jose Luis; and Di Pietro Elizaran, Rodolfo, 3,899,690.

Arzi, Friedrich; Hofert, Paul; and Sudler, Roland, to VDO Adolf Schindling AG. Electric clock. 3,898,789, Cl. 58-23.00R.

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Associated Electrical Industries Limited: *See—*
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Aston, Owen, to Haueter, Carl R., a part interest. Apparatus for testing alternator diodes. 3,899,737, Cl. 324-158.00D.

Atlantic Richfield Company: *See—*
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Auston, David Henry; and Glass, Alastair Malcolm, to Bell Telephone Laboratories, Incorporated. Millimeter wave devices utilizing electrically polarized media. 3,899,428, Cl. 250-199.000.

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Aya, Norimoto. *See—*
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Aya, Toshihiko; Chiba, Kazumasa; and Izumi, Zenzi, to Toray Industries, Inc. Chelating resin and process for preparing the same. 3,899,472, Cl. 260-80.780.

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Barkan, Harold; Brayman, George E.; and Swartz, Jerome, to Hall-Barkan Instruments, Inc. Touch lamp, latching AC solid state touch switch usable with such lamp, and circuits for the same. 3,899,713, Cl. 315-34.000.

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Bedwell, Thomas A.; and Call, Bruce L., to Hesston Corporation. Liquid manure loading apparatus. 3,899,066, Cl. 198-7.00R.

Beer, Fred Albert, to Beer Precast Concrete Limited. Rainscreen wall panel. 3,898,780, Cl. 52-303.000.

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Bendix Corporation, The: *See*—
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Berg, Francis H., co-executor: *See*—
Berg, Quentin, deceased; Berg, Francis H., co-executor; and Dauphin Deposit Trust Co., co-executor, 3,899,232.

Berg, Quentin, deceased; by Berg, Francis H., co-executor; and Dauphin Deposit Trust Co., co-executor, to du Pont de Nemours, E. I., and Company. Circuit board socket. 3,899,232, Cl. 339-17.00C.

Bergersen, Earl O. Orthodontic appliance and method of using same. 3,898,736, Cl. 32-14.00B.

Berk, Charles W.: *See*—
Sitek, George J.; and Berk, Charles W., 3,899,627.

Berman, Elliot; and Ekman, Carl F. W., to Itek Corporation. Photosensitive composition containing TiO_2 having a particle size of about 25 millimicrons and the use thereof in physical development. 3,899,333, Cl. 96-48.0PD.

Bernhardt, Helmuth, to Jos. Schneider & Co. Optische Werke Kreuznach. Testing device for cinematographic cameras. 3,899,245, Cl. 352-72.000.

Berni, Ralph J.; and Harris, James A., to United States of America, Agriculture. Treatment of cotton with glycidyl methacrylate using ionizing radiation. 3,899,289, Cl. 8-120.000.

Bertellini, Gianfranco: *See*—
Butti, Adriano; Prino, Giuseppe; and Bertellini, Gianfranco, 3,899,481.

Bertram, August H.: *See*—
Griffith, Bobby D.; and Bertram, August H., 3,899,038.

Beschke, Helmut; Schaefer, Hans; and Schuler, Wilhelm Alfons, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of 2,6-dichloropyridine. 3,899,495, Cl. 260-290.0HL.

Besherse, Stella. Umbrella puppet stage. 3,899,168, Cl. 272-21.000.

Bethlehem Steel Corporation: *See*—
Oliver, Evan M.; and Marsilio, Joseph V., 3,899,321.

Beyers, Marvin E.: *See*—
Grawey, Charles E.; Untz, Robert W.; and Beyers, Marvin E., 3,899,220.

Bickman, Bernard F., to United States of America, Army. Gas-operated uncaging mechanism. 3,898,889, Cl. 74-5.120.

Billberg, Alfred, to Lisnave-Estaleiros Navais de Lisboa, S.A.R.L. Device to compensate pressure and losses of inert gas. 3,898,998, Cl. 137-113.000.

Binding, Kenneth W.; and Laberis, George A., to Beatrice Foods Co. Foldable car top carrier. 3,899,110, Cl. 224-42.10F.

Binding, Kenneth W.; and Laberis, George A., to Beatrice Foods Co. Car top carrier for gutterless car tops. 3,899,111, Cl. 224-42.10F.

Binnie, Alexander J.; Bowdell, Kenneth; and Clark, Philip James, to George Kent Ltd. Interrogation of remote stations. 3,899,774, Cl. 340-163.000.

Bio-Medical Sciences, Inc.: *See*—
Halpern, Donald F., 3,899,295.

Birchall, James Derek; Cassidy, John Edward; Rolfe, Nicholas; and Miles, Clifford Granville, to Imperial Chemical Industries Limited. Complex phosphates. 3,899,342, Cl. 106-65.000.

Bird, Margaret Ellen; and Senior, Norman, to Imperial Chemical Industries Limited. Griseofulvin compositions. 3,899,578, Cl. 424-81.000.

Bittner, Emil: *See*—
Jovanovics, Karolina; Szasz, Kalman; Fekete, Gyorgy; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 3,899,493.

Blackburn, Reginald Mayman; and Airey, Harold Edwin, to Platt International Limited. Fibre control arrangements for textile drafting systems. 3,898,712, Cl. 19-244.000.

Blackwell, Philip A., Jr.: *See*—
Miller, Jacob I.; Dudley, Gaston E.; Blackwell, Philip A., Jr.; and Owens, Omer O., 3,899,497.

Block Engineering, Inc.: *See*—
Hirschfeld, Tomas, 3,899,297.

Blomstrom, Gary D.; Miller, Lindell L.; and York, Lyle E., to Caterpillar Tractor Co. Combined integral component enclosure and track roller frame. 3,899,218, Cl. 305-9.000.

Bloom, Stanley M.; and Hadzekyriakides, Nicholas S., to Polaroid Corporation. Multicolor dye developer diffusion transfer processes with pyrazolo-[3,4d] pyrimidines. 3,899,331, Cl. 96-3.000.

Bloom, Stanley M.; and Garcia, Paulina P., to Polaroid Corporation. Photographic processes and products employing benzindole phthaleins as optical filter agents. 3,899,511, Cl. 260-326.130.

Blundell, Thomas: *See*—
Colchester, John Edward; and Blundell, Thomas, 3,899,499.
Colchester, John Edward; and Blundell, Thomas, 3,899,500.

Bobalek, Edward G.: *See*—
Newbould, John; Eusebi, Elio; and Bobalek, Edward G., 3,899,462.

Bodlaj, Viktor, to Siemens Aktiengesellschaft. Method for the frequency stabilization of a laser. 3,899,748, Cl. 331-94.50S.

Bodonyi, Janos, to Marconi Company Limited, The. Microwave phase correcting network utilizing waveguide coupler having mismatched ports caused by laterally displaced end section. 3,899,756, Cl. 333-10.000.

Boege, Dietrich A. H. Method of and device for the identification and reduction of peaks in chromatograms. 3,898,837, Cl. 73-23.100.

Boeing Company, The: *See*—
Ancker-Johnson, Betsy, 3,899,430.
Lang, John M., 3,899,070.

Boggs, Roger L., to Caterpillar Tractor Co. Self-cleaning sprocket means. 3,899,219, Cl. 305-13.000.

Bogusch, Erich, to Tyrolit-Schleifmittelwerke Swarovski K.G. Grinding disk. 3,898,773, Cl. 51-206.0NF.

Boice, G. Newton, to Structural Systems, Inc. Connector element for use in modular wall construction. 3,899,259, Cl. 403-405.000.

Bolger, Thomas Vincent, to RCA Corporation. Integral correlation and transverse equalization method and apparatus. 3,899,666, Cl. 235-181.000.

Boliden Aktiebolag: *See—*
Petersson, Stig Arvid, 3,899,308.

Bom, Cornelis Johannes Gerardus: *See—*
Van Der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 3,899,029.
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 3,899,030.
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 3,899,138.

Bonacci, John C.; and Burgess, William P., to Mobil Oil Corporation. Octane cracking. 3,899,411, Cl. 208-66.000.

Bonar, George D. Automobile seat automatic passenger-securing device. 3,899,042, Cl. 180-82.00C.

Bondi, Joseph V.: *See—*
O'Neill, Joseph L.; and Bondi, Joseph V., 3,899,580.

Bonk, Henry W.; and Shah, Tilak M., to Upjohn Company, The. Polyurethanes from 3,3-'dimethyl-diphenyl-4,4'-diisocyanate polyester diols and bis(hydroxyethyl ether) of hydroquinone. 3,899,467, Cl. 260-47.0CB.

Bono, Pierre: *See—*
Groult, Pierre; Hubert, Francois; Daunay, Jacques; and Bono, Pierre, 3,899,356.

Borchard, Edwin Harley; and Pohl, Karl-Heinz, to Bell Telephone Laboratories, Incorporated. Printed circuit card guide. 3,899,721, Cl. 317-101.0DH.

Borggrafe, Bernt: *See—*
Zander, Bernd; Borggrafe, Bernt; and Wortmann, Horst, 3,899,023.

Borisenko, Gleb Pavlovich; Chernobrivenko, Jury Sergeevich; Kutsov, Jury Georgievich; Gorbanev, Arkady Alexeevich; Kukushkin, Oleg Nikolaevich; Krivobokov, Vladimir Nikolaevich; Pobegailo, Grigory Gavrilovich; and Nashivanko, Vitaly Dmitrievich. Roll stand. 3,898,830, Cl. 72-249.000.

Borlinghaus, Hans J., to General Motors Corporation. Detented cover assembly for vehicle deck lid lock. 3,898,824, Cl. 70-455.000.

Born, Ellis H.: *See—*
Adams, Cecil E.; Born, Ellis H.; and Smith, Gary C., Jr., 3,898,917.

Botros, Raouf: *See—*
Renfrew, Edgar E.; and Botros, Raouf, 3,899,519.

Boudreaux, Gordon J.: *See—*
Daigle, Donald J.; Pepperman, Armand B., Jr.; and Boudreaux, Gordon J., 3,899,618.

Bourguet, Jean; and Gauberthier, Joseph, to Teal, Societe des Procedes L'Air Liquide et Technip de Liquefaction des Gaz Naturels. Process for regulating the quantity of cold delivered by a refrigerating installation. 3,898,857, Cl. 62-117.000.

Bowater Packaging Limited: *See—*
Winter, Alan William, 3,899,277.

Bowdell, Kenneth: *See—*
Binnie, Alexander J.; Bowdell, Kenneth; and Clark, Philip James, 3,899,774.

Bower, Alfred L.: *See—*
Fead, William A.; Glynn, Thomas M.; Sbarra, Joseph F.; and Bower, Alfred L., 3,899,278.

Bowman, Howard J.; and Schindler, Donald G., to United States Steel Corporation. Method and apparatus for control of weld temperature in a high frequency electric resistance welded pipe mill. 3,899,651, Cl. 219-67.000.

Brack, Jacques, to Olin Ski AG. Explosively actuated fastener driving power tools. 3,899,113, Cl. 227-10.000.

Brackenridge, David R.: *See—*
Dubeck, Michael; and Brackenridge, David R., 3,899,466.

Bradbury, Bernard G.: *See—*
Norlie, Bruce; and Bradbury, Bernard G., 3,898,935.

Braddock, John B.: *See—*
Hodges, James T., Jr.; Braddock, John B.; and Dishman, George C., 3,899,142.

Braden, Lorraine W.; and Broome, Etrulia A., to said Lorraine W. Braden, by said Etrulia A. Broome. Method of making a quilt. 3,898,943, Cl. 112-262.000.

Brafman, Hanoch, to Yeda Research and Development Company Incorporated. Processor for controlling the operation of a telephone. 3,899,645, Cl. 179-90.0AD.

Brand, Siegfried F. Warp knitting machine. 3,898,819, Cl. 66-87.000.

Brand, Siegfried F. Warp knit fabrics. 3,898,820, Cl. 66-195.000.

Brandt, Randy; and Rice, Richard B., to Cermetek, Inc. Frequency shift keyed detector. 3,899,741, Cl. 329-104.000.

Branlard, Paul; and Modiano, Jacques, to Distugil. Production of polychloroprene. 3,899,459, Cl. 260-27.0BB.

Branson Ultrasonics Corporation: *See—*
Mims, Bruce L., 3,899,116.

Brantman, Leon L.: *See—*
Canale, Raymond P.; and Brantman, Leon L., 3,898,796.

Braunhut, Harold N. Aquatic speedway. 3,899,167, Cl. 272-4.000.

Bray, Ralph, to Aeronutronic Ford Corporation. Electrical connector. 3,899,231, Cl. 339-17.0LC.

Brayman, George E.: *See—*
Barkan, Harold; Brayman, George E.; and Swartz, Jerome, 3,899,713.

Bredeson, Dean K.; Harrison, John R.; and Johnson, Earl A. N., to French Oil Mill Machinery Company, The. Continuous rendering apparatus. 3,899,301, Cl. 23-280.000.

Bredt, James H.; and Kendall, Louis F., Jr., to General Electric Company. Stabilized p-type lead telluride. 3,899,360, Cl. 136-238.000.

Breford, Glenn H., to Midway Industries, Inc. Adjustable list pin box. 3,899,194, Cl. 280-438.00R.

Bridon Limited: *See—*
Guy, Raymond, 3,899,365.

Briggs, Eugene C.; and Reichel, Lee E., to Koehring Company. Compactor. 3,899,263, Cl. 404-133.000.

Briggs, Paul Raymond, Jr., to Bell Telephone Laboratories, Incorporated. Connecting block structures for modular main distribution frames. 3,899,237, Cl. 339-99.000.

Brignole, Frederick A., to Litton Business Systems, Inc. Ribbon cassettes for single element typewriters. 3,899,065, Cl. 197-151.000.

Brinkmeier, Friedhelm, to Windmoller & Holscher. Apparatus for applying labels coated with pressure-sensitive adhesive. 3,899,385, Cl. 156-521.000.

Bristol-Myers Company: *See—*
Willner, David; and Crast, Leonard Bruce, Jr., 3,899,394.

British Nuclear Fuels Limited: *See—*
Casey, Wilfred, 3,898,741.

Brodie, Merritt H. Frankfurter/hamburger bun. 3,899,603, Cl. 426-138.000.

Brolin, Stephen Joseph, to Bell Telephone Laboratories, Incorporated. Delta modulation and demodulation with syllabic companding. 3,899,754, Cl. 332-11.00D.

Broome, Etrulia A.: *See—*
Braden, Lorraine W.; and Broome, Etrulia A., 3,898,943.

Brotz, Gunther: *See—*
Heide, Helmut; Hoffmann, Ulrich; Brotz, Gunther; and Poeschel, Eva, 3,899,556.

Brown, Dwight C.: *See—*
Parks, Lloyd, deceased; and Brown, Dwight C., 3,899,170.

Brown, Leon Henry, Jr., to Wangco Incorporated. Front loading disc drive apparatus. 3,899,794, Cl. 360-133.000.

Brown, Louise H.; and Swidler, Ronald, to Tallow Company. Corrosion inhibitor composition and process. 3,899,535, Cl. 260-570.80R.

Brown, Patrick Harold; and Sivyer, Raymond Frank, to EMI Limited. Cathode ray tube acoustic transducers. 3,899,709, Cl. 313-369.000.

Brunda, Michael J., to Standard Packaging Corporation. Pill package. 3,899,080, Cl. 206-531.000.

Bryant, Samuel T.: *See—*
Shepherd, Glen C.; Allen, James B.; and Bryant, Samuel T., 3,898,860.

Bucher, Hans R.: *See—*
Bamberg, Jack A.; Bucher, Hans R.; and Bultena, John G., 3,899,250.

Budzyna, Edward S., to Rockwell International Corporation. Weft cutter control apparatus. 3,899,008, Cl. 139-302.000.

Buhler, Arthur; Schutz, Hans Ulrich; Mausezahl, Dieter; Harris, Melvin; and Guth, Christian, to Ciba Geigy AG. Process for the manufacture of new condensates. 3,899,469, Cl. 260-67.500.

Bulka, Raymond I., to McCain Manufacturing Corporation. Trimming machines. 3,898,903, Cl. 83-387.000.

Bultena, John G.: *See—*
Bamberg, Jack A.; Bucher, Hans R.; and Bultena, John G., 3,899,250.

Burger Boy Red Top Refreshment Kiosks Limited: *See—*
Savage, Jack Mark Charles, 3,898,922.

Burgess, William P.: *See—*
Bonacci, John C.; and Burgess, William P., 3,899,411.

Burnett, Richard T.; and Colpaert, James J., to Bendix Corporation, The. Disc brake. 3,899,052, Cl. 188-73.600.

Burns, Raymond K.; Shure, Lloyd I.; and Katzen, Elliott D., to United States of America, Aeronautics and Space Administration. Protected isotope heat source. 3,899,680, Cl. 250-496.000.

Burris Industries, Inc.: *See—*
Grachten, Erich, 3,898,939.

Bush, Harley E., to NL Industries, Inc. Method for inhibiting the corrosion of iron and alloys thereof in an aqueous environment with sulfite compositions. 3,899,293, Cl. 21-2.70A.

Bushnell, James D.; and Fiocco, Robert J., to Exxon Research and Engineering Company. Extraction apparatus. 3,899,299, Cl. 23-270.500.

Busse, Wolfgang: *See—*
Werner, Peter; Drews, Ulrich; Rittmannsberger, Norbert; Busse, Wolfgang; Moder, Helmut; and Ohr, Karl-Heinz, 3,898,964.

Butcher, Julia A.; and McLean, Daniel E. Body motion system. 3,898,985, Cl. 128-63.000.

Butti, Adriano; Prino, Giuseppe; and Bertellini, Gianfranco, to Crinos Industria Farmacobiologica S.A. Process for the controlled partial degradation of deoxyribonucleic acid extracted from animal organs. 3,899,481, Cl. 260-211.50R.

Byrd Associates: *See—*
Byrd, David J.; and Harris, Deane F., 3,898,698.

Byrd, David J.; and Harris, Deane F., to Byrd Associates. Necktie. 3,898,698, Cl. 2-150.000.

C.A.V. Limited: *See—*
Russell, Michael Frederick, 3,898,885.
Williams, Malcolm; Jones, Christopher Robin; and Crookes, Richard William, 3,898,969.

C. B. Kaupp & Sons, Inc.: *See—*
Jenkins, Bernard M., 3,899,649.

C. L. Frost & Son, Inc.: *See*—
Frost, Charles C.; Van Der Meulen, Douglas J.; and Weis, Siegfried K., 3,898,888.
Frost, Ruben E.; and Van Der Meulen, Douglas J., 3,899,226.
Caban, Reinaldo: *See*—
Chapman, Thomas W.; and Caban, Reinaldo, 3,899,570.
Cadez, August; and Schaumann, Rolf, to BBC Brown Boveri & Company Limited. Plastics-insulated switch unit for multi-phase high-voltage switchgear installations with earthing contact. 3,899,722, Cl. 317-103.000.
Cailloux, Paul, to Promecam Sisson-Lehmann. Rocking action shearing apparatus with clamping means. 3,898,902, Cl. 83-378.000.
California Cement Shake Co., Inc.: *See*—
Jakel, Gus R., 3,899,344.
California Institute of Technology: *See*—
Rembaum, Alan; and Yen, Shiao-Ping S., 3,899,534.
Calistrat, Michael M., to Koppers Company, Inc. Dynamically piloted gear coupling. 3,898,813, Cl. 64-9.00R.
Call, Bruce L.: *See*—
Bedwell, Thomas A.; and Call, Bruce L., 3,899,066.
Camboulives, Andre Alphonse Mederic Leon; Le Maout, Theophile Francois; and Zibette, Bernard Arthur, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation de France. Nozzles having a variable cross-section. 3,899,133, Cl. 239-265.390.
Campanis, Alexander. Baseball Glove. 3,898,696, Cl. 2-19.000.
Canale, Raymond P.; and Brantman, Leon L., to Colt Industries Operating Corporation. Ambient compensating means. 3,898,796, Cl. 60-39.28R.
Cannuli, Vincent Michael: *See*—
Ladany, Ivan; and Cannuli, Vincent Michael, 3,899,371.
Canon Kabushiki Kaisha: *See*—
Karube, Yukuo, 3,899,660.
Taguchi, Tatsuya; Uchiyama, Takashi; Nakamoto, Soichi; and Ito, Tadashi, 3,899,789.
Takahashi, Toru, 3,899,249.
Capannini, Sanzio: *See*—
Piacente, Luigi; and Capannini, Sanzio, 3,899,640.
Capewell, Terence John; and Craven, Donald, to Joseph Lucas (Industries) Limited. Actuator with a torque limiting device. 3,898,817, Cl. 64-30.00E.
Cappelle, Norman D.; Meyer, Walter; and Tap, Henry H., to Oak Industries, Inc. Television tuner. 3,898,879, Cl. 74-10.150.
Capsonic Group, Inc.: *See*—
Hilgers, Raymond H.; and Liautaud, James P., 3,899,305.
Carl Schenck AG, Firma: *See*—
Wawra, Carl Martin, 3,898,874.
Carlsson, Eric Harald, to Carlsson, Eric Harald. Drying apparatus for concentrating solutions. 3,898,745, Cl. 34-9.000.
Carre, Jean-Jacques, to Societe Anonyme D.B.A. Hydraulic control circuit. 3,899,057, Cl. 188-351.000.
Carrier Corporation: *See*—
Kerschbaumer, Hans Gerhard; and Endress, James W., 3,898,862.
Carter, J. Warne. Device for temporarily providing a seal within an advancing pipe. 3,898,918, Cl. 92-92.000.
Carter, Joseph V., II, to Lily Mills Company. Apparatus for applying hang tabs to zippers. 3,898,725, Cl. 29-211.00R.
Cascone, Paul J.: *See*—
Knopp, Walter V.; and Cascone, Paul J., 3,899,306.
Casey, Wilfred, to British Nuclear Fuels Limited. Measuring apparatus. 3,898,741, Cl. 33-178.00F.
Cassai, Eugene; Halasz, Andrew; and Hanke, Edward Herman, to American Can Company. Die assembly and method for interior roll-necking-in a tubular member. 3,898,828, Cl. 72-117.000.
Cassidy, John Edward: *See*—
Birchall, James Derek; Cassidy, John Edward; Rolfe, Nicholas; and Miles, Clifford Granville, 3,899,342.
Castera, Andre; and Lucaire, Pierre, to Manufacture de Machines du Haut-Rhin S.A. Training bullet for fire arms. 3,898,933, Cl. 102-92.700.
Caswell, Robert L., to Rockwell International Corporation. Constant current source. 3,899,692, Cl. 307-228.000.
Caterpillar Tractor Co.: *See*—
Allen, Jan K., 3,899,093.
Blomstrom, Gary D.; Miller, Lindell L.; and York, Lyle E., 3,899,218.
Boggs, Roger L., 3,899,219.
Grawey, Charles E.; Untz, Robert W.; and Beyers, Marvin E., 3,899,220.
Griffith, Bobby D.; and Bertram, August H., 3,899,038.
Habiger, Cyril W., 3,898,807.
Pasquini, Daniel, 3,899,058.
Cebalo, Tony, to Air Products and Chemicals, Inc. Method of producing 1,3,4-thiadiazol-2-ylureas. 3,899,505, Cl. 260-306.80D.
Celanese Corporation: *See*—
Lloyd, Neil E., 3,898,719.
Peterkofsky, Alan L.; Tracy, James E.; and Schumacher, Paul M., 3,899,457.
Peterkofsky, Alan L.; Tracy, James E.; and Schumacher, Paul M., 3,899,458.
Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: *See*—
Pirlet, Robert Alfred, 3,899,663.
Centre National d'Etudes Spatiales: *See*—
Decramer, Lionel; and Mauroy, Philippe, 3,899,674.
Centre National pour l'Exploitation des Oceans: *See*—
Pocachard, Alain, 3,899,790.
Cermetek, Inc.: *See*—
Brandt, Randy; and Rice, Richard B., 3,899,741.
Certain-teed Products Corporation: *See*—
Heilmayr, Peter F., 3,899,561.
Champleboux, Jacques; and Delaux, Robert, to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes. Tubes provided with connecting flanges. 3,899,006, Cl. 138-109.000.
Chandross, Edwin Arthur; Pryde, Coralie Anne; and Salmon, Warren Allen, to Bell Telephone Laboratories, Incorporated. Radiation sensitive marking and process utilizing same. 3,899,678, Cl. 250-484.000.
Chang, Clarence D.; and Lang, William H., to Mobil Oil Corporation. Conversion of alcohols and ethers to hydrocarbons. 3,899,544, Cl. 260-668.00C.
Chaparro, John J.; Ellis, Lowell V.; Meanor, Doyle W.; Morton, William D., Jr.; Richelmann, Bernd H.; Ross, George B.; and Toth, John E., to Delta Design, Inc. Integrated circuit handling system. 3,899,085, Cl. 214-1.0BB.
Chapman, Thomas W.; and Caban, Reinaldo, to Wisconsin Alumni Research Foundation. Extraction of mercuric chloride from dilute solution and recovery. 3,899,570, Cl. 423-100.000.
Chase, Alfred E., Jr.: *See*—
Keating, John H.; and Chase, Alfred E., Jr., 3,899,101.
Chaudhuri, Kiranendu B., to Swiss Aluminium Ltd. Method of tapping aluminum from a cell for electrolytic recovery of aluminum. 3,899,402, Cl. 204-67.000.
Chemetron Corporation: *See*—
Wallace, Gary Leonard; Linehan, John J.; and Marshall, Robert Howard, 3,899,068.
Chen, Nai Yuen; and Srinivasan, Sundaresa, to Mobil Oil Corporation. Process for the growth of hydrocarbon-consuming microorganisms. 3,898,959, Cl. 195-28.00R.
Chernobrivenko, Jury Sergeevich: *See*—
Borisenko, Gleb Pavlovich; Chernobrivenko, Jury Sergeevich; Kutsov, Jury Georgievich; Gorbanev, Arkady Alexeevich; Kukushkin, Oleg Nikolaevich; Krivobokov, Vladimir Nikolaevich; Pobegailo, Grigory Gavrilovich; and Nashivanko, Vitaly Dmitrievich, 3,898,830.
Chevron Research Company: *See*—
Hotten, Bruce W., 3,899,475.
Magee, Philip S., 3,899,318.
Rothert, Kenneth; Dexter, Donald D.; and Hartmann, Lester M., 3,899,432.
Chew, Clarence W. Vacuum operated fruit picker. 3,898,785, Cl. 56-332.000.
Chi, Donald G.; and Lee, Hanju, to W. R. Grace & Co. Alumina-zeolite composite adsorbents for refrigerants. 3,899,310, Cl. 55-71.000.
Chiba, Kazumasa: *See*—
Aya, Toshihiko; Chiba, Kazumasa; and Izumi, Zenzi, 3,899,472.
Chiba, Keiichi: *See*—
Ohba, Motoichi; and Chiba, Keiichi, 3,898,810.
Chicago Bridge & Iron Company: *See*—
McCabe, John Stanton, 3,898,846.
Chiklis, Charles K., to Polaroid Corporation. Battery assembly. 3,899,355, Cl. 136-111.000.
Chodil, Gerald J.; and De Jule, Michael C., to Zenith Radio Corporation. High brightness gas discharge display device. 3,899,636, Cl. 178-7.30D.
Chou, Albert S.; Tong, Yang Hu; Medley, Harold C.; and Dalziel, Warren L., to Shugart Associates. Mechanism for clamping and driving a flexible disc. 3,898,814, Cl. 64-22.000.
Christel, Conrad: *See*—
Sauer, Gale E.; and Christel, Conrad, 3,898,784.
Christmas, Ronald Jack, to Ronson Products Limited. Cigarette lighter cover. 3,899,285, Cl. 431-152.000.
Ciba Geigy AG: *See*—
Buhler, Arthur; Schutz, Hans Ulrich; Mausezahl, Dieter; Harris, Melvin; and Guth, Christian, 3,899,469.
Ciba-Geigy Corporation: *See*—
Puck, Alfred, 3,899,630.
Ramey, Chester E.; and Luzzi, John J., 3,899,491.
Cincinnati Milacron Chemicals, Incorporated: *See*—
Stapfer, Christian H., 3,899,465.
Cincinnati Milacron-Heald Corporation: *See*—
Kuniholm, Martin L., 3,898,771.
Cirigliano, Charles F. Chair and method of making a chair. 3,899,208, Cl. 297-258.000.
Cities Service Company: *See*—
Newcombe, Jack, 3,899,463.
Roth, Shirley H., 3,899,468.
Stoy, William S.; and Roth, Shirley H., 3,899,546.
Cities Service Oil Company: *See*—
Kelseaux, Ray M.; Dobbs, Harold J.; and Priehe, Frank D., 3,898,880.
Rees, Thomas E.; and Priebe, Frank D., 3,899,032.
Citizen Watch Company, Limited: *See*—
Takamune, Hirotoki; and Ishida, Fujio, 3,898,790.
City of Edmonton, The: *See*—
Cleveley, John B.; and Laubman, Kenneth C., 3,899,639.
Clare, Geraldine M. Bookmarks. 3,898,951, Cl. 116-119.000.
Clark, Billy E., to Lynes, Inc. Inflatable sealing element having electrical conductors extending therethrough. 3,899,631, Cl. 174-47.000.
Clark Equipment Company: *See*—
Hansen, Howard C., 3,899,046.
Steelman, Melvin W., 3,898,864.

Clark, Philip James: *See—*
Binnie, Alexander J.; Bowdell, Kenneth; and Clark, Philip James, 3,899,774.
Clasen, Theodor: *See—*
Beaver, Ruby C.; Clasen, Theodor; Henning, Wolfgang; and Johnson, Emil S., 3,899,734.
Claudel S.A.: *See—*
Stenne, Pierre, 3,899,595.
Stenne, Pierre, 3,899,596.
Clauser, Milton J.: *See—*
Beckner, Everet H.; and Clauser, Milton J., 3,899,681.
Clements, Herbert Arthur, to S.S.S. Patents Limited. Pawl and ratchet mechanism. 3,899,060, Cl. 192-67.00A.
Cleon Corporation: *See—*
Floyd, Roger F., 3,899,675.
Cleveley, John B.; and Laubman, Kenneth C., to City of Edmonton, The. System and method for reading remotely located meters. 3,899,639, Cl. 179-2.00A.
Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Stabilized droplet method of making deep diodes having uniform electrical properties. 3,899,361, Cl. 148-1.500.
Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Thermomigration of metal-rich liquid wires through semiconductor materials. 3,899,362, Cl. 148-1.500.
Clinton, Charles M.: *See—*
Legatti, Raymond H.; Clinton, Charles M.; and Draper, Charles W., 3,899,717.
Cluett, Peabody & Co., Inc.: *See—*
Crawford, Douglas J.; LeMere, Roger; and Hughes, Francis H., 3,898,941.
Clusener, Gerhard R., to Theta Industries, Inc. Differential dilatometer. 3,898,836, Cl. 73-16.000.
Cobb, Douglas Romain; Holtz, Roger Edward; and Trimble, David Carlaw, to Bell Telephone Laboratories, Incorporated. Telephone set speech network. 3,899,646, Cl. 179-170.0NC.
Cobe Laboratories, Inc.: *See—*
Morgan, Brian E., 3,898,988.
Codding, Elias H.; and King, Hoyd S., Jr., to Petty-Ray Geophysical, Inc. Sorting machine with digital error correction. 3,899,415, Cl. 209-111.600.
Coenders, Willi; and Trockel, Franz, to Heinrich Koppers Gesellschaft mit beschrankter Haftung. Connecting arrangement for connecting two vessels. 3,899,197, Cl. 285-14.000.
Coffman, William H., Jr., to Lewbill Industries Inc. Humidifier mounting for warm air heating system. 3,898,976, Cl. 126-113.000.
Colchester, John Edward; and Blundell, Thomas, to Imperial Chemical Industries Limited. Manufacture of bipyridylium salts. 3,899,499, Cl. 260-295.0AM.
Colchester, John Edward; and Blundell, Thomas, to Imperial Chemical Industries Limited. Manufacture of bipyridylium salts. 3,899,500, Cl. 260-295.0AM.
Cole, Edward L.; and Hess, Howard V., to Texaco Inc. Process for treating citrus wastes to obtain water insoluble essential oils. 3,899,398, Cl. 201-2.500.
Coletti, Joseph L.: *See—*
Sulzer, Hans D.; and Coletti, Joseph L., 3,899,391.
Colgate-Palmolive Company: *See—*
Freedman, Jules, 3,899,512.
Colloton, Marcus J., to Allis-Chalmers Corporation. Foot and hand control for hydrostatic transmission. 3,898,891, Cl. 74-474.000.
Colpaert, James J.: *See—*
Burnett, Richard T.; and Colpaert, James J., 3,899,052.
Colt Industries Operating Corporation: *See—*
Canale, Raymond P.; and Brantman, Leon L., 3,898,796.
Colton, Peter Malcolm, to Wadkin Limited. Setting up machine including computer-controlled positioner for machine part adjusting element. 3,899,724, Cl. 318-162.000.
Columbia Pictures Industries, Inc.: *See—*
Sorenson, Keith S.; and Lewis, David E., 3,899,633.
Como, John J.: *See—*
Moskowitz, Gerard J.; Como, John J.; and Feldman, Louis I., 3,899,395.
Compagnie Honeywell Bull: *See—*
Sigel, Pierre Louis; and Grosjean, Henri, 3,899,233.
Concast AG: *See—*
Koenig, Peter J., 3,899,018.
Conde Kabushiki Kaisha: *See—*
Himeno, Shohachi, 3,898,735.
Connelly Containers, Inc.: *See—*
Herbetko, Stephen A., 3,899,121.
Connelly, John J., to International Harvester Company. Ultrasonic scanning system. 3,898,838, Cl. 73-67.80S.
Connelly, Thomas Macfarlane; Rowe, Ian George; and Morrison, Douglas Stewart, to Begg Cousland & Co. Ltd. Device for separating particles from a fluid stream. 3,899,427, Cl. 210-521.000.
Conorich, Theodore Alan, to Bell Telephone Laboratories, Incorporated. Impact tool. 3,898,724, Cl. 29-203.00H.
Conrad, Horst: *See—*
Wagner, Kuno; Dietrich, Werner; Kraft, Karl-Josef; and Conrad, Horst, 3,899,454.
Conrath, Richard L.; and Beare, Robert B., to Fedders Corporation. Lock assembly. 3,899,230, Cl. 312-319.000.
Consiglio Nazionale Delle Ricerche: *See—*
Bencini, Mario; and Fantacchiotti, Massimo, 3,899,664.
Construction Materials Division General Electric Company: *See—*
Alley, Robert P., 3,899,632.
Container Corporation of America: *See—*
Andrews, Richard E.; Desmond, John D.; and Hart, Joseph J., 3,899,125.
Desmond, John D.; and Hart, Joseph J., 3,899,124.
Continental Can Company, Inc.: *See—*
Galitz, Raymond F., 3,898,954.
Holk, Albert J., Jr.; and Hawkins, Jerry D., 3,898,944.
Peyser, Harry A.; and Heaviside, Robert D., 3,899,117.
Continental Oil Company: *See—*
Culter, John D., 3,899,026.
Starks, Charles M.; and Gordon, Ronnie D., 3,899,542.
Tucker, Robert B., Jr., 3,899,668.
Cook, Charles Wayne, to Fiber Industries, Inc. Process and apparatus for producing readily processible staple fiber and tow. 3,898,710, Cl. 19-.460.
Cook, Edward H., Jr.; and Emery, Alvin T., to Hooker Chemicals & Plastics Corporation. Electrolytic method of making concentrated hydroxide solutions by sequential use of 3-compartment and 2-compartment electrolytic cells having separating compartment walls of particular cation-active permselective membranes. 3,899,403, Cl. 204-98.000.
Cook, Edward H., Jr.: *See—*
Schultz, Robert F.; and Cook, Edward H., Jr., 3,899,409.
Cook, Elton S.; and Tanaka, Kinji, to Stanley Drug Products, Inc. Method and compositions for inducing resistance to bacterial infections. 3,899,589, Cl. 424-319.000.
Cope, Raymond. Dental spigot control device. 3,898,737, Cl. 32-22.000.
Copeland, James L.; and Mizuno, William G., to Economics Laboratory, Inc. Machine dishwashing detergent having a reduced condensed phosphate content. 3,899,436, Cl. 252-99.000.
Corbett, Paul M., to SCM Corporation. Flux for continuous casting of steel. 3,899,324, Cl. 75-94.000.
Cormier, Joseph Tilmon. Cable stripper. 3,898,733, Cl. 30-90.400.
Corne, Seymour Jeffrey, to Aspro-Nicholas Limited. Treatment of hyperlipidaemia. 3,899,590, Cl. 424-324.000.
Cornelius Company, The: *See—*
McMillin, John R., 3,898,861.
Corning Glass Works: *See—*
Frost, Rodney I.; and Holleran, Louis M., 3,899,326.
Malmendier, Joseph W., 3,899,340.
Coronelli, Carolina; Bardone, Maria Rosa; and Pagani, Hermes, to Gruppo Lepetit S.p.A. Antibiotic activities from streptosporangium vulgare ATCC 21906. 3,899,396, Cl. 195-80.00R.
Corsmeier, Robert J.: *See—*
Dennis, Ronald E.; Treece, William D.; and Corsmeier, Robert J., 3,899,267.
Cosmo, Inc.: *See—*
Rizzo, Earl, 3,898,763.
Cosyns, Jean; Franck, Jean-Pierre; and Le Page, Jean-Francois, to Institut Francais du Petrole des Carburants et Lubrifiants. Process for hydrogenating aromatic compounds containing sulfur impurities. 3,899,543, Cl. 260-667.000.
Cotton Incorporated: *See—*
Le Blanc, Robert Bruce, 3,899,483.
Coulson, Robert Bernard: *See—*
Esteron, Maurice; and Coulson, Robert Bernard, 3,899,715.
Courduvelis, Constantine I., to Enthone, Incorporated. Process for conditioning ABS resin surface. 3,899,617, Cl. 427-304.000.
Couture, Warren A. Molded filament coating die. 3,898,953, Cl. 118-125.000.
Cox, Elmer Adrian; Tiner, Wayne Douglas; and Woods, Ritchey Paul, Jr., to H. B. Zachary Co. Precast concrete housing. 3,898,776, Cl. 52-79.000.
Cox, Robert J. Hygenic syringe unit. 3,898,989, Cl. 128-232.000.
Craig, David R.; Lederle, George M.; and Plante, Franklin T., to International Business Machines Corporation. Process for the production of magnetic materials having selective coercivity by using selected D.C. magnetic fields. 3,899,369, Cl. 148-108.000.
Craigie, Samuel W., to M. L. Aviation Company Limited. Ejector release unit for use in aircraft. 3,898,909, Cl. 89-1.50F.
Crast, Leonard Bruce, Jr.: *See—*
Willner, David; and Crast, Leonard Bruce, Jr., 3,899,394.
Craven, Donald: *See—*
Capewell, Terence John; and Craven, Donald, 3,898,817.
Crawford, Douglas J.; LeMere, Roger; and Hughes, Francis H., to Cluett, Peabody & Co., Inc. Apparatus for manufacturing and stacking hemmed fabric pieces. 3,898,941, Cl. 112-121.290.
Cretex Companies, Inc., The: *See—*
Bailey, John M.; and Longfellow, Richard C., 3,899,280.
Crinos Industria Farmacobiologica S.A.: *See—*
Butti, Adriano; Prino, Giuseppe; and Bertellini, Gianfranco, 3,899,481.
Croft, Edward Francis Beverley, to Associated Electrical Industries Limited. Apparatus and method for electroslag remelting. 3,899,017, Cl. 164-52.000.
Crookes, Richard William: *See—*
Williams, Malcolm; Jones, Christopher Robin; and Crookes, Richard William, 3,898,969.
Crown Zellerbach Corporation: *See—*
Stollberg, Ray H.; and Leaky, Joseph W., 3,899,123.
Crytzer, Layton D.: *See—*
Osborn, Merlin L.; Crytzer, Layton D.; and Stewart, Donald M., 3,899,733.
Csicsatka, Antal, to General Electric Company. Biasing circuit for multistage transistor amplifiers. 3,899,743, Cl. 330-22.000.

Culter, John D., to Continental Oil Company. Use of thermal insulating fluids in wells. 3,899,026, Cl. 166-302.000.

Cummins, Stewart E. Bistable positioner comprising a dimensionally bistable ferroelectric crystal. 3,899,697, Cl. 310-8.000.

Curfhey, Charles P. Ice rink mould and method of constructing an ice rink utilizing the mould. 3,898,855, Cl. 62-75.000.

Curry, Norman Royce, to Auto Steering Trailers Limited. Self-steering bogies for trailers. 3,899,188, Cl. 280-81.00A.

Curtiss, Alan C., to Pfizer Inc. Disc dispenser. 3,899,011, Cl. 141-325.000.

Curtiss-Wright Corporation: *See—*
Pratt, Winthrop B., 3,899,272.

Czerwinski, Watson P., to United States of America, Army. Triplex antenna. 3,899,787, Cl. 343-790.000.

Daigle, Donald J.; Pepperman, Armand B., Jr.; and Boudreaux, Gordon J., to United States of America, Agriculture. Process for flameproofing cellulosic textiles. 3,899,618, Cl. 427-396.000.

Daigle, Donald J.; Pepperman, Armand B., Jr.; and Vail, Sidney L., to United States of America, Agriculture. 1,3,5-Triaza-7-phosphaadamantane and derivatives as flame retardants for textiles. 3,899,619, Cl. 427-396.000.

Daigneault, Theodore J., Jr., to Texas Instruments Incorporated. Thermally actuated switch. 3,899,765, Cl. 337-386.000.

Daimler-Benz Aktiengesellschaft: *See—*
Trube, Hans; Grimm, Hermann; and Karioth, Gernot, 3,898,921.

Dale, Walter J.: *See—*
Haraway, William H., Jr.; Dale, Walter J.; and McErlean, Edwin A., 3,898,730.

Dalziel, Warren L.: *See—*
Chou, Albert S.; Tong, Yang Hu; Medley, Harold C.; and Dalziel, Warren L., 3,898,814.

Daniels, Dennis, to U.S. Amada, Ltd. Shearing apparatus and sheet transfer mechanism. 3,898,904, Cl. 83-404.200.

Dannert, Dietmar; Ihlenburg, Rainer; Nackmayr, Dietrich; Goetze, Rudolf; Kruger, Wolfgang; Peter, Hartmut; Westphal, Klaus; and Thuy, Hans-Joachim, to TED Bildplatten Aktiengesellschaft. Playback method and system. 3,899,181, Cl. 274-1.00R.

Danquechin Dorval, Edmond. Liquid metering device. 3,899,106, Cl. 222-177.000.

Darack, John R.: *See—*
Nickerson, John T. R.; and Darack, John R., 3,899,594.

Darby, James J., Jr., to Marsh-McBirney, Inc. Apparatus for measuring the velocity of flow of an electrically conductive fluid. 3,898,881, Cl. 73-181.000.

Dashner, James W., to International Telephone and Telegraph Corporation. Fire hydrant. 3,899,196, Cl. 285-2.000.

Data Time, Inc.: *See—*
Hunt, Theodore R., 3,899,644.

Daunay, Jacques: *See—*
Groult, Pierre; Hubert, Francois; Daunay, Jacques; and Bono, Pierre, 3,899,356.

Dauphin Deposit Trust Co., co-executor: *See—*
Berg, Quentin, deceased; Berg, Francis H., co-executor; and Dauphin Deposit Trust Co., co-executor, 3,899,232.

Davies, David H.: *See—*
Dixon, George D.; Davies, David H.; and Voytko, John D., 3,899,254.

Davison, Ellison L.; and Ziegler, Leo D., to Mine Safety Appliances Company. Ear protecting device for safety caps. 3,898,700, Cl. 2-209.000.

Dawans, Francois: *See—*
Goldenberg, Emmanuel; Dawans, Francois; Durand, Jean-Pierre; and Martino, Germain, 3,899,474.

de Ahna, Heinz-Dieter; and von der Gonna, Rudiger, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Praseodymium containing ceramic pigments. 3,899,347, Cl. 106-299.000.

Dean, Jimmie L.: *See—*
Hudson, Jimmie E.; and Dean, Jimmie L., 3,899,279.

DeCaussin, David Edward, to Fadel Engineering Co. Remotely operated draw bar tool changer. 3,898,911, Cl. 90-11.00D.

Decker, John J.; and Kerstetter, Donald R., to GTE Sylvania Incorporated. Diffusion bonded cathode for electron discharge device. 3,898,721, Cl. 29-25.140.

Decramer, Lionel; and Mauroy, Philippe, to Centre National d'Etudes Spatiales. Cryogenic radiators for radiometers, and more particularly for satellite-supported radiometers. 3,899,674, Cl. 250-352.000.

Degener, Eberhart: *See—*
Wessling, Diether; Leister, Heinrich; and Degener, Eberhart, 3,899,504.

De Jule, Michael C.: *See—*
Chodil, Gerald J.; and De Jule, Michael C., 3,899,636.

Delaux, Robert: *See—*
Champleboux, Jacques; and Delaux, Robert, 3,899,006.

Delfortrie, Pierre. Flashlight casing for a flat-shaped battery. 3,899,670, Cl. 240-10.650.

Delta Design, Inc.: *See—*
Chaparro, John J.; Ellis, Lowell V.; Meanor, Doyle W.; Morton, William D., Jr.; Richelmann, Bernd H.; Ross, George B.; and Toth, John E., 3,899,085.

Demarcq, Michel, to Produits Chimiques Ugine Kuhlmann. Method for alkoxylation of chlorides and bromides of trivalent phosphorus. 3,899,550, Cl. 260-977.000.

den Hertog, Willem Cornelis: *See—*
de Putter, Warner Jan; and den Hertog, Willem Cornelis, 3,899,565.

Denis, David R.: *See—*
Abram, Stewart J.; Denis, David R.; Heinze, Alex E.; Johnson, Leonard M.; and Taylor, Edward, 3,899,165.

Dennard, Robert H.; Rideout, Vincent L.; and Walker, Edward J., to International Business Machines Corporation. Method and device for reducing sidewall conduction in recessed oxide pet arrays. 3,899,363, Cl. 148-1.500.

Dennis, Ronald E.; Treece, William D.; and Corsmeier, Robert J., to General Electric Company. Turbomachinery blade tip cap configuration. 3,899,267, Cl. 416-92.000.

Deno, Norman C.: *See—*
Turner, John O.; and Deno, Norman C., 3,899,538.

de Putter, Warner Jan; and den Hertog, Willem Cornelis, to Wavin B. V. Method for forming tube with thickened socket end. 3,899,565, Cl. 264-296.000.

Deshev, Mincho Borislavov: *See—*
Alexandrov, Alexander Damyanov; Trifonov, Todor Kostov; Stefanov, Stefan Ivanov; Apostolov, Paskal Spasov; and Deshev, Mincho Borislavov, 3,899,021.

Desmond, John D.; and Hart, Joseph J., to Container Corporation of America. Reinforced automatic bottom closure. 3,899,124, Cl. 229-41.00B.

Desmond, John D.: *See—*
Andrews, Richard E.; Desmond, John D.; and Hart, Joseph J., 3,899,125.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Beschke, Helmut; Schaefer, Hans; and Schuler, Wilhelm Alfons, 3,899,495.
de Ahna, Heinz-Dieter; and von der Gonna, Rudiger, 3,899,347.

Dexter, Donald D.: *See—*
Rothert, Kenneth; Dexter, Donald D.; and Hartmann, Lester M., 3,899,432.

Dezseri, Eszter: *See—*
Jovanovics, Karolina; Szasz, Kalman; Fekete, Gyorgy; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 3,899,493.

Diamond, Morris B. Rotary power device. 3,899,269, Cl. 418-35.000.

Diamond Power Specialty Corporation: *See—*
Thayer, John R., 3,899,727.

Diamond Shamrock Corporation: *See—*
Huba, Francis; and Banner, Robert G., 3,899,501.

Dick Tyrrell Jewelers, Inc.: *See—*
Jacobson, Kent L., 3,898,870.

Dickason, Alan F., to Sun Ventures, Inc. Oxidation of butane to maleic anhydride using butane-rich feed. 3,899,516, Cl. 260-346.80A.

Didier-Werke AG: *See—*
Schwarz, Hans Georg, 3,899,341.

Diehl, Homer R.: *See—*
Ambrozetes, James P.; and Diehl, Homer R., 3,899,078.

Dietrich, Werner: *See—*
Wagner, Kuno; Dietrich, Werner; Kraft, Karl-Josef; and Conrad, Horst, 3,899,454.

Dietze, Wolfgang, to Siemens Aktiengesellschaft. Hollow semiconductor bodies and method of producing the same. 3,899,557, Cl. 264-81.000.

Dilley, Gerald G.: *See—*
Mead, Stanley L.; and Dilley, Gerald G., 3,898,924.

Dimeff, John, to United States of America, General Counsel-Code GP. NDIR gas analyzer based on absorption modulation ratios for known and unknown samples. 3,899,252, Cl. 356-51.000.

Dinning, Robert W., to Macco Oil Tool Company, Inc. Pump down system for placing and retrieving subsurface well equipment. 3,899,025, Cl. 166-117.500.

Di Pietro Elizaran, Rodolfo: *See—*
Gomez Llona, Jose Luis; and Di Pietro Elizaran, Rodolfo, 3,899,690.

Director-General of the Agency of Industrial Science and Technology: *See—*
Hashimoto, Masanao; and Ohnuma, Kiyoshi, 3,898,893.

Dirigo Corporation: *See—*
Nickerson, John T. R.; and Darack, John R., 3,899,594.

Dishman, George C.: *See—*
Hodges, James T., Jr.; Braddock, John B.; and Dishman, George C., 3,899,142.

Distugil: *See—*
Branlard, Paul; and Modiano, Jacques, 3,899,459.

Dixon, George D.; Davies, David H.; and Voytko, John D., to Westinghouse Electric Corporation. Chemical light meter and method of measuring light therewith. 3,899,254, Cl. 356-234.000.

Dobbs, Harold J.: *See—*
Kelseaux, Ray M.; Dobbs, Harold J.; and Priehe, Frank D., 3,898,880.

Doerr, Carl L. Hydraulic bicycle brake assembly. 3,899,056, Cl. 188-344.000.

D'Olier, George, to Raybestos-Manhattan, Inc. Thermally insulated exhaust gas reactor. 3,899,300, Cl. 23-277.00C.

Donato, Anthony C., to Lightolier Incorporated. Integrated ceiling system. 3,898,782, Cl. 52-488.000.

Dorkin, Jess. Shears. 3,898,734, Cl. 30-233.000.

Dorn, Conrad P., Jr.: *See—*
Shen, Tsung-Ying; Dorn, Conrad P., Jr.; and Li, Jorge P., 3,899,506.

Dorner, Heinrich; Scholz, Manfred; and Jungmann, Axel, to Siemens Aktiengesellschaft. Nuclear reactor assembly. 3,899,393, Cl. 176-87.000.

Dow Chemical Company, The: *See—*
Sylkhouse, Thomas E., 3,899,374.

Vaughn, Walter Lee; and Beam, Robert James, 3,899,389.

Dow Corning Corporation: *See—*
Speier, John L.; and LeGrow, Gary E., 3,899,515.

Draper, Charles W.: *See—*
Legatti, Raymond H.; Clinton, Charles M.; and Draper, Charles W., 3,899,717.

Draper, Robert, to White-Westinghouse Corporation. Liquid crystal door window shutter arrangement for self-cleaning cooking oven. 3,898,977, Cl. 126-200.000.

Dresbach, James Bernard. Noncompetitive pacemaker with programmable unijunction transistors. 3,898,995, Cl. 128-419.0PG.

Dresser Industries, Inc.: *See—*
Thompson, John R., 3,899,307.
Wyant, Reece E., 3,898,849.
Wyant, Reece E., 3,898,850.
Wyant, Reece E., 3,898,851.
Young, James Whitehurst, 3,898,815.

Dresser, Thorpe: *See—*
Ohlswager, Stanley; Edison, Robert R.; and Dresser, Thorpe, 3,899,000.

Drews, Ulrich: *See—*
Werner, Peter; Drews, Ulrich; Rittmannsberger, Norbert; Busse, Wolfgang; Moder, Helmut; and Ohr, Karl-Heinz, 3,898,964.

Dubeck, Michael; and Brackenridge, David R., to Ethyl Corporation. Brominated xylene diols. 3,899,466, Cl. 260-45.95L.

Dudley, Gaston E.: *See—*
Miller, Jacob I.; Dudley, Gaston E.; Blackwell, Philip A., Jr.; and Owens, Omer O., 3,899,497.

Duffy, Walter Roy. Conveyor belt protective system. 3,899,071, Cl. 198-232.000.

Duke, Gene S., to H. C. Duke & Son, Inc. Apparatus and method for the preparation of soft serve products. 3,898,859, Cl. 62-135.000.

Dumanov, Ivan Minkov: *See—*
Makedonski, Boris Georgiev; Kochemidov, Atanas Dimitrov; Dumanov, Ivan Minkov; and Payakov, Stefan Georgiev, 3,898,769.

Dunlop Limited: *See—*
Gebert, Karl; and Schmitt, Otto, 3,899,015.
Wragg, Reginald Trevor; and Yardley, James Frank, 3,899,378.

du Pont de Nemours, E. I., and Company: *See—*
Berg, Quentin, deceased; Berg, Francis H., co-executor; and Dauphin Deposit Trust Co., co-executor, 3,899,232.
Hoehn, Harvey Herbert; and Richter, John W., 3,899,309.
Kalil, James, 3,899,438.

Durand, Jean-Pierre: *See—*
Goldenberg, Emmanuel; Dawans, Francois; Durand, Jean-Pierre; and Martino, Germain, 3,899,474.

Dzus Fastener Co. Inc.: *See—*
Aylott, John F., 3,898,716.

E. R. Squibb & Sons, Inc.: *See—*
Szczesniak, Raymond A., 3,899,298.

Eastman Kodak Company: *See—*
Przezdziecki, Wojciech Maria, 3,899,335.
Sweet, Clyde W., 3,899,600.

Eastwood, Alan: *See—*
Shotbolt, Keith; Eastwood, Alan; and Gait, John Henry, 3,899,081.

Eastwood, H. Keith; and Noval, Barry A., to Multi-State Devices Ltd. Method of producing thin film devices of doped vanadium oxide material. 3,899,407, Cl. 204-192.000.

Eaton Corporation: *See—*
Leichliter, Wayne K., 3,899,059.
Neuman, Richard, 3,898,915.
Swedberg, Nils Einar, 3,899,270.
Walton, Erlen Busch, 3,898,812.

Eckold, Gerd-Jurgen; and Maass, Hans, to Paweck AG. Tool for bending workpieces such as tubes and sections. 3,898,832, Cl. 72-389.000.

Ecodyn Systems, Inc.: *See—*
McSheehy, Richard Y.; and Jones, Harold G., 3,898,854.

Ecodyne Corporation: *See—*
Furlong, Donn B.; and Ovard, John C., 3,899,553.

Economics Laboratory, Inc.: *See—*
Copeland, James L.; and Mizuno, William G., 3,899,436.
Freis, Richard E.; and Rue, Larry M., 3,899,387.

Ede, Ainsley Neville. Ground drainage systems, and method and apparatus therefor. 3,898,940, Cl. 111-1.000.

Edelstein, Arthur, to Bell & Howell Company. Combined microfiche reader and projector. 3,899,246, Cl. 353-27.000.

Edison, Robert R.: *See—*
Ohlswager, Stanley; Edison, Robert R.; and Dresser, Thorpe, 3,899,000.

Eglitis, Vilis Yanovich: *See—*
Mendelevsky, Yakov Idelevich; Vaistub, Mikhail Efimovich; and Eglitis, Vilis Yanovich, 3,899,222.

Ehlers, Robert, to Triplex Safety Glass Company Limited. Bending of glass sheets. 3,899,316, Cl. 65-106.000.

Ekman, Carl F. W.: *See—*
Berman, Elliot; and Ekman, Carl F. W., 3,899,333.

Elam, James O. Device and method for detecting the degree of muscle relaxation of a medical patient. 3,898,983, Cl. 128-2.00N.

Elam, James O. Breathing responsive device and method. 3,898,987, Cl. 128-145.800.

Electric Machinery Mfg. Company: *See—*
Smith, Forest D., 3,899,731.

Electricity Council, The: *See—*
Francis, Peter Douglas; Redford, Ronald Albert; Gale, Philip Franklin; and Hillis, Maurice Raymond, 3,899,685.

Electro-Therm, Inc.: *See—*
Skinner, Charles Arthur, 3,899,655.

Electromagnetic Industries, Inc.: *See—*
Legatti, Raymond H.; Clinton, Charles M.; and Draper, Charles W., 3,899,717.

Electronic Molding Corporation: *See—*
Murphy, James V., 3,899,719.

Electronic Monitors, Inc.: *See—*
Basham, Raymond B., 3,898,981.

Elektroschmelzwerk Kempten GmbH: *See—*
Benecke, Theodor; Wiebke, Gunter; and Pfannenschmidt, Carl, 3,899,320.

Eles, Janos: *See—*
Jovanovics, Karolina; Szasz, Kalman; Fekete, Gyorgy; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 3,899,493.

Eli Lilly and Company: *See—*
Suarez, Tulio; Kornfeld, Edmund C.; and Sheneman, Jack M., 3,899,592.
Wikel, James H., 3,899,508.

Ellis, Lowell V.: *See—*
Chaparro, John J.; Ellis, Lowell V.; Meanor, Doyle W.; Morton, William D., Jr.; Richelmann, Bernd H.; Ross, George B.; and Toth, John E., 3,899,085.

Ellmore, John W., to Allister Manufacturing Company, Inc. Automatic reversing control equipment. 3,899,726, Cl. 318-472.000.

Elmore, J. Russell; and Benson, Carl F., to Torrington Company, The. Radial and thrust bearing. 3,899,225, Cl. 308-174.000.

Emanuel, Carl F., to Resources Conservation Co. Method for chemical fractionation, defatting and dewatering of solids and suspensions. 3,899,419, Cl. 210-22.000.

Emblem, Harold Garton, to Zirconal Processes Limited. Method of preparing moulds for casting metals. 3,899,612, Cl. 427-133.000.

Emery, Alvin T.: *See—*
Cook, Edward H., Jr.; and Emery, Alvin T., 3,899,403.

Emery, Arthur Richard, to Superior Electric Company, The. Maximum speed control circuit for a stepping motor. 3,899,729, Cl. 318-696.000.

Emeury, Jean Marie: *See—*
Girardon, Hubert; and Emeury, Jean Marie, 3,899,536.

EMI Limited: *See—*
Brown, Patrick Harold; and Sivyer, Raymond Frank, 3,899,709.

Endress, James W.: *See—*
Kerschbaumer, Hans Gerhard; and Endress, James W., 3,898,862.

Energy Conversion Devices, Inc.: *See—*
Fleming, Gordon R.; and Ovshinsky, Stanford R., 3,899,558.

Engelhard Minerals & Chemicals Corporation: *See—*
Lim, John C., 3,899,343.

Engelmann, Herbert F., to Engelmann Microwave Co. Microwave oscillator. 3,899,752, Cl. 331-101.000.

Engelmann Microwave Co.: *See—*
Engelmann, Herbert F., 3,899,752.

English Electric Valve Company Limited: *See—*
Esteron, Maurice; and Coulson, Robert Bernard, 3,899,715.
Esterson, Maurice; and Weaver, Francis James, 3,899,714.

Enthone, Incorporated: *See—*
Courduvelis, Constantine I., 3,899,617.

Enviro-Blast International: *See—*
Gilbert, Neal J.; and Horton, Edward L., 3,898,768.

Epiling, Karol E.: *See—*
Tonnelli, Gerald J.; Epiling, Karol E.; and Ahrens, James R., 3,899,024.

Epstein, Louis S. Universal size disposable shoe cover. 3,898,750, Cl. 36-49.000.

Erco Industries Ltd.: *See—*
Palmer, Malcolm George, 3,899,375.

Erickson, Floyd B., to Monsanto Company. Photoimaging procedures and compositions. 3,899,334, Cl. 96-48.00R.

Erickson, Lennart G.; and Erickson, William S. Slotted drainage conduit and integral concrete floor. 3,898,778, Cl. 52-169.000.

Erickson, V. Robert. Soft ice cream machine. 3,898,858, Cl. 62-135.000.

Erickson, William S.: *See—*
Erickson, Lennart G.; and Erickson, William S., 3,898,778.

Erji: *See—*
Pocachard, Alain, 3,899,790.

Ernst Leitz GmbH: *See—*
Frenk, Helmuth; and Leitz, Ludwig, 3,899,251.

Ernst Winter & Sohn: *See—*
Sawluk, Wlodzimierz, 3,898,772.

Esch, Ronald Philip; and Huang, Patrick Chin-Sheng, to International Business Machines Corporation. Process for controlling insulating film thickness across a semiconductor wafer. 3,899,372, Cl. 148-187.000.

Esseluhn, Werner F.: *See—*
Fegley, Charles R.; and Esseluhn, Werner F., 3,899,105.

Esser, Karl; Friedrich, Robert; and Segain, John E., to International Standard Electric Corporation. Charge carrier foil. 3,899,327, Cl. 96-1.500.

Establissements du Paroy: *See—*
Soler, Salvador Forroll, 3,899,608.

Esteron, Maurice; and Coulson, Robert Bernard, to English Electric Valve Company Limited. Magnetron with rotatable tuning means. 3,899,715, Cl. 315-39.610.

Esterson, Maurice; and Weaver, Francis James, to English Electric Valve Company Limited. Quick starting magnetron with shielded cathode. 3,899,714, Cl. 315-39.510.
Ethyl Corporation: *See—*
Dubeck, Michael; and Brackenridge, David R., 3,899,466.
Stephens, Ruth E., 3,899,444.
Unick, Alvin J.; and Gault, Kenneth W., 3,899,433.
Etra, Richard Henry, to Bell Telephone Laboratories, Incorporated. Four-wire backup facility using DDD lines. 3,899,641, Cl. 179-18.0EA.
Eubank, Marcus P. Apparatus facilitating burial in the vertical position. 3,898,718, Cl. 27-35.000.
Eusebi, Elio: *See—*
Newbould, John; Eusebi, Elio; and Bobalek, Edward G., 3,899,462.
Evans, Albert Edward John; Aincough, Anthony Norbert; and Verschoore, Koen, to Koninklijke Emballage Industrie Van Leer B.V. Method of pretreating metal surfaces. 3,899,364, Cl. 148-6.15R.
Evans, James P. Mud flap mounting assembly. 3,899,193, Cl. 280-154.50R.
Evans, Leo G.; and Ruthel, Walter W., to Hooker Chemicals & Plastics Corporation. Cathode finger structure for an electrolytic cell. 3,899,408, Cl. 204-286.000.
Evans Products Company: *See—*
Jesse, Edwin L., 3,899,282.
Evers, Walter. Complex compounds of aspartic acid with a rare earth metal and zinc. 3,899,521, Cl. 260-429.200.
Ewald, Jerome T.; and Lewis, Richard L., to Bendix Corporation, The. Concentric brake booster with accumulator. 3,898,808, Cl. 60-403.000.
Ewald, Jerome T.: *See—*
Hendrickson, Richard T.; Lewis, Richard L.; Ewald, Jerome T.; Bach, Lloyd G.; and Hickner, George B., 3,898,913.
Exxon Research and Engineering Company: *See—*
Bushnell, James D.; and Fiocco, Robert J., 3,899,299.
Gardiner, John Brooke, 3,899,434.
Shaw, Henry; and Angier, Derek J., 3,899,573.
Ezoe, Takuji; and Shirai, Kikuo, to Kokusai Cable Ship Co., Ltd. Ditching machines for submarine cable. 3,898,852, Cl. 61-72.400.
Ezra C. Lundahl, Inc.: *See—*
Lundahl, Ezra Cordell, 3,898,786.
Facchini, Bruno. Transparent paving tile structure. 3,898,781, Cl. 52-311.000.
Fadel Engineering Co.: *See—*
DeCaussin, David Edward, 3,898,911.
Fairweather, John Anthony: *See—*
Rowe, Frederick; Norton, Michael George; and Fairweather, John Anthony, 3,899,412.
Faller, Werner, to Jos. Schneider & Co. Optische Werke Kreuznach. Optical position indicator. 3,899,247, Cl. 353-40.000.
Famolare, Inc.: *See—*
Famolare, Joseph P., Jr., 3,898,749.
Famolare, Joseph P., Jr., to Famolare, Inc. Removable sole for shoe skate. 3,898,749, Cl. 36-2.50R.
Fantacchiotti, Massimo: *See—*
Bencini, Mario; and Fantacchiotti, Massimo, 3,899,664.
Fantasia, John F.; and Ingrao, Hector C., to United States of America, Transportation. Airborne laser remote sensing system for the detection and identification of oil spills. 3,899,213, Cl. 250-301.000.
Farelli, Mario. Cylindrical tubular union provided with an integral pressing formed thread for the engagement with a screw cap. 3,899,004, Cl. 138-89.000.
Farley, Earl T.: *See—*
Willard, Frank G.; and Farley, Earl T., 3,899,637.
Farrington, Gregory C.; Will, Fritz G.; and Lord, Peter C., to General Electric Company. Sealed primary sodium-halogen cell. 3,899,352, Cl. 136-83.00R.
Faure, Guy: *See—*
Godart, Jean; and Faure, Guy, 3,898,726.
Fead, William A.; Glynn, Thomas M.; Sbarra, Joseph F.; and Bower, Alfred L., to American Cyanamid Company. Blow molding apparatus. 3,899,278, Cl. 425-387.00B.
Fedders Corporation: *See—*
Conrath, Richard L.; and Beare, Robert B., 3,899,230.
Fegley, Charles R.; and Esseluhn, Werner F. Chemical irritant spray device. 3,899,105, Cl. 222-5.000.
Fehrer, Ernst. Process of spinning textile fibers. 3,898,788, Cl. 57-156.000.
Feicht, Erwin; Haug, Werner Otto; Remshardt, Rolf; and Schettler, Helmut, to International Business Machines Corporation. Means for equalizing line potential when the connecting switch is open. 3,899,777, Cl. 340-173.00R.
Fein, Marvin M.: *See—*
Barabas, Eugene S.; and Fein, Marvin M., 3,899,461.
Fekete, Gyorgy: *See—*
Jovanovics, Karolina; Szasz, Kalman; Fekete, Gyorgy; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 3,899,493.
Feldman, Louis I.: *See—*
Moskowitz, Gerard J.; Como, John J.; and Feldman, Louis I., 3,899,395.
Ferguson, Dale L.: *See—*
Matlock, Robert B.; Wilmer, Reginald B.; and Ferguson, Dale L., 3,898,783.
Fernholz, Hans; Wunder, Friedrich; and Schmidt, Hans-Joachim, to Hoechst Aktiengesellschaft. Process for the preparation of propionaldehyde. 3,899,539, Cl. 260-601.00R.
Ferrentino, Antonio, to Industrie Pirelli S.p.A. Method and apparatus for joining a flexible waveguide to another element. 3,898,727, Cl. 29-600.000.
Ferrigno, Thomas Howard. Opacity modified pigmentary compositions. 3,899,346, Cl. 106-288.000.
Ferro Manufacturing Corporation: *See—*
Pickles, Joseph, 3,899,202.
Fiber Industries, Inc.: *See—*
Cook, Charles Wayne, 3,898,710.
Fiberglass Resources Corporation: *See—*
Klimpl, Fred, 3,899,005.
Figura, William L., to Jacobsen Manufacturing Company. Vehicle frame and drive train. 3,899,040, Cl. 180-27.000.
Fiocco, Robert J.: *See—*
Bushnell, James D.; and Fiocco, Robert J., 3,899,299.
Firestone Tire and Rubber Company, The: *See—*
Roodvoets, Mark R., 3,899,406.
Fischer, Artur. Expansion anchor. 3,898,907, Cl. 85-64.000.
Fischer, Bertram: *See—*
Maier, Gerhard; and Fischer, Bertram, 3,899,758.
Fischer, Francis A. Auxiliary fluid injection system for internal combustion engine. 3,898,965, Cl. 123-75.00B.
Fischer, Hugo J. Multi-load self-centering work holding vise. 3,899,162, Cl. 269-25.000.
Fischer, Valentine J.; Ponzoni, George Bernard; and Tressler, Charles J., to General Foods Corporation. Fortified gelating dessert powder and process. 3,899,598, Cl. 426-73.000.
Flanders, Robert George. Teaching or like devices. 3,898,748, Cl. 35-48.00A.
Flatau, Abraham; Olson, Donald N.; and Miller, Miles C. Nonhazardous ring airfoil projectile for delivery of non-lethal material. 3,898,932, Cl. 102-66.000.
Fleck, Fritz; Mercer, Alec Victor; Paver, Roger; and Schmid, Horst, to Sandoz Ltd. Phenylstilbene triazole compounds. 3,899,487, Cl. 260-240.00C.
Fleckenstein, Erwin; Mohr, Reinhard; and Heinrich, Ernst, to Hoechst Aktiengesellschaft. Basic azo dyestuffs of the 2,6-diamino-pyridine series. 3,899,478, Cl. 260-156.000.
Fleming, Alva H. Antenna mounting bracket for a truck cab. 3,899,148, Cl. 248-43.000.
Fleming, Gordon R.; and Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Method of making a current controlling device including VO_x. 3,899,558, Cl. 264-104.000.
Flessner, Hinrich; and Hoffmeister, Bernhard, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Device ofr damping pendulum movements. 3,899,083, Cl. 212-14.000.
Florian, John, to Mobil Oil Corporation. Bottle carrier. 3,899,076, Cl. 206-427.000.
Floyd, Roger F., to Cleon Corporation. Whole body imaging. 3,899,675, Cl. 250-369.000.
FMC Corporation: *See—*
Koch, Walter T.; and Wielicki, Edward A., 3,899,452.
Foley, Kevin M.; and Vigo, Francesco M., to Owens-Corning Fiberglas Corporation. Complex organo silicon compounds. 3,899,524, Cl. 260-448.80R.
Foote, D. Paul, to Xerox Corporation. Process for forming an electrode. 3,898,722, Cl. 29-25.420.
Ford Motor Company: *See—*
Slotkowski, Kenneth G., 3,899,770.
Forkner, John H., to Pillsbury Company, The. Process for the treatment of coconut and food products resulting therefrom. 3,899,606, Cl. 426-250.000.
Fradkin, Eli H., to Owens-Illinois, Inc. Paperboard blank with crushed offset flap edges and method for forming same. 3,899,120, Cl. 229-32.000.
Francis, Peter Douglas; Redford, Ronald Albert; Gale, Philip Franklin; and Hillis, Maurice Raymond, to Electricity Council, The. Ozonisers. 3,899,685, Cl. 250-536.000.
Franck, Jean-Pierre: *See—*
Cosyns, Jean; Franck, Jean-Pierre; and Le Page, Jean-Francois, 3,899,543.
Frank, Klaus: *See—*
Schwartz, Gunther; and Frank, Klaus, 3,899,416.
Franz Morat GmbH, Firma: *See—*
Schmidt, Gerhard, 3,898,818.
Frauendorf, Manfred, to Normbau GmbH Maschinen-Papparate-Werkzeuge & Co. Apparatus for steaming and smoothing of articles of clothing in a closed chamber. 3,899,108, Cl. 223-51.000.
Fred D. Pfening Company, The: *See—*
Morris, Gilbert C., 3,899,417.
Freedman, Jules, to Colgate-Palmolive Company. Benzoxepin derivatives. 3,899,512, Cl. 260-343.20R.
Freis, Richard E.; and Rue, Larry M., to Economics Laboratory, Inc. Process of making paper using mono-isocyanate capped poly (oxyalkylene) diols as a re-wetting and defoaming agent. 3,899,387, Cl. 162-158.000.
French, Charlie N.: *See—*
Lindahl, Robert E.; and French, Charlie N., 3,898,816.
French Oil Mill Machinery Company, The: *See—*
Bredeson, Dean K.; Harrison, John R.; and Johnson, Earl A. N., 3,899,301.
Frenk, Helmuth; and Leitz, Ludwig, to Ernst Leitz GmbH. Apparatus and method for measuring the relative distance and optionally the relative velocity of an object. 3,899,251, Cl. 356-28.000.

Frick, Douglas G.; Morgan, Thomas R.; and Streeter, Terry L., to Allied Chemical Corporation. Alumina removal from chromate leach liquors. 3,899,568, Cl. 423-55.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Flessner, Hinrich; and Hoffmeister, Bernhard, 3,899,083.
Schwarz, Wilhelm, 3,899,160.
Wehling, Rolf; and Neubert, Rolf, 3,898,787.

Friedl, Franz, to Semperit Aktiengesellschaft. Hollow inflatable formwork elements for producing concrete structures. 3,899,153, Cl. 249-65.000.

Friedrich, John P., to United States of America, Agriculture. Recovery and reactivation of rhodium hydroformylation catalysts. 3,899,442, Cl. 252-416.000.

Friedrich, Robert: *See—*
Esser, Karl; Friedrich, Robert; and Segain, John E., 3,899,327.

Frost, Charles C.; Van Der Meulen, Douglas J.; and Weis, Siegfried K., to C. L. Frost & Son, Inc. Pulley construction. 3,898,888, Cl. 74-230.800.

Frost, Rodney I.; and Holleran, Louis M., to Corning Glass Works. Method of making monolithic honeycombed structures. 3,899,326, Cl. 75-214.000.

Frost, Ruben E.; and Van Der Meulen, Douglas J., to C. L. Frost & Son, Inc. Bearing assembly. 3,899,226, Cl. 308-187.100.

Fuchs, Friedrich: *See—*
Petersen, Harro; Fuchs, Friedrich; and Scharwaechter, Peter, 3,899,548.
Petersen, Harro; Fuchs, Friedrich; and Scharwaechter, Peter, 3,899,549.

Fuji Denki Seizo Kabushiki Kaisha: *See—*
Ogawa, Takashi; Sugiyama, Shunichi; and Kida, Kiyonori, 3,899,701.

Fuji Photo Film Co., Ltd.: *See—*
Ikegami, Yoshizo; and Fukeda, Susumu, 3,898,930.
Inayama, Takayuki, 3,899,613.
Shirahata, Ryuji; Kitamoto, Tatsuji; Shimizu, Mahito; and Suzuki, Masaaki, 3,898,952.

Fujitsu Limited: *See—*
Nakagami, Takakiyo; Hatanaka, Kazunari; and Ishizaki, Masayuki, 3,899,757.

Fujiwara, Yasuhiko: *See—*
Maeda, Teruo; Shimoe, Hideo; Fujiwara, Yasuhiko; Aya, Norimoto; Marumo, Nagayuki; Tsuji, Heigo; and Sakamoto, Yuzo, 3,899,047.

Fukeda, Susumu: *See—*
Ikegami, Yoshizo; and Fukeda, Susumu, 3,898,930.

Fukuta, Norikiko; and Paik, Young H., to United States of America, Interior. Apparatus for generating ice nuclei smoke particles for weather modification. 3,899,129, Cl. 239-14.000.

Funston, David Lee, to GTE Sylvania Incorporated. Electronic channel address remote control system. 3,899,760, Cl. 334-9.000.

Furlong, Donn B.; and Ovard, John C., to Ecodyne Corporation. Cooling tower plume control. 3,899,553, Cl. 261-109.000.

Furuya, Shoji; Takahashi, Masaoki; and Matsushima, Masatoshi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Furnace charging apparatus. 3,899,088, Cl. 214-35.00R.

G. Methven & Co., Limited: *See—*
Waterston, William, 3,898,843.

Gaal, Denes. Paint can adaptor. 3,899,107, Cl. 222-570.000.

Gabor, Dennis, to International Business Machines Corporation. Method for distinguishing similar subjects using discriminating holograms. 3,899,240, Cl. 350-3.500.

GAF Corporation: *See—*
Barabas, Eugene S.; and Fein, Marvin M., 3,899,461.
Lorenz, Donald H.; and Williams, Earl P., 3,899,471.
Waxman, Burton Harvey; Shannahan, Robert Thomas; and Viro, Felix, 3,899,330.

Gait, John Henry: *See—*
Shotbolt, Keith; Eastwood, Alan; and Gait, John Henry, 3,899,081.

Gale, Philip Franklin: *See—*
Francis, Peter Douglas; Redford, Ronald Albert; Gale, Philip Franklin; and Hillis, Maurice Raymond, 3,899,685.

Galerne, Jean. Keratinic fibres oxidation dyeing compositions containing a carbonate of an alkali metal amino acid. 3,899,288, Cl. 8-10.200.

Galitz, Raymond F., to Continental Can Company, Inc. Compound applying machine. 3,898,954, Cl. 118-315.000.

Gallaher, William C.; Stephens, Jerome P.; Testa, Phillip J.; and Wein, James E., to McDonnell Douglas Corporation. Convertible seat-bed equipment. 3,898,704, Cl. 5-2.00R.

Gamble, Kenneth H., to Scovill Manufacturing Company. Fluid conduits. 3,899,200, Cl. 285-93.000.

Gammel, Josef Engelbert, to Siemens Aktiengesellschaft. Two oscillators alternately switched into a phase lock loop with outputs taken only during free running period of each oscillator. 3,899,746, Cl. 331-2.000.

Gaon, David E., to GTE Automatic Electric Laboratories Incorporated. Timing error detection circuit. 3,899,665, Cl. 235-153.00A.

Garcia, Paulina P.: *See—*
Bloom, Stanley M.; and Garcia, Paulina P., 3,899,511.

Gardiner, John Brooke, to Exxon Research and Engineering Company. Hydroxylated polymers useful as additives for fuels and lubricants. 3,899,434, Cl. 252-52.00R.

Garey, Robert B., to Westinghouse Electric Corporation. Self-aligning coupling. 3,899,199, Cl. 285-27.000.

Garman, David M.: *See—*
Isenhower, Robert H., deceased; Isenhower, Bonnie J., executrix; and Garman, David M., 3,898,908.

Garrett, John Austin: *See—*
Neville, Richard Ernest Gartside; and Garrett, John Austin, 3,898,996.

Gasparini, Francis A.: *See—*
Stewart, Richard F.; and Gasparini, Francis A., 3,898,865.

Gauberthier, Joseph: *See—*
Bourguet, Jean; and Gauberthier, Joseph, 3,898,857.

Gaudreault, Eugene H., to Minnesota Mining and Manufacturing Company. Temperature compensated voltage reference device. 3,899,693, Cl. 307-297.000.

Gault, Kenneth W.: *See—*
Unick, Alvin J.; and Gault, Kenneth W., 3,899,433.

Gaysert, Gerhard, to J. Eberspacher. Apparatus for the catalytic purification of exhaust gases of internal combustion engines. 3,899,303, Cl. 23-288.00F.

Gayso, Donald W. Vibrating dental packer. 3,898,739, Cl. 32-53.000.

Gebert, Karl; and Schmitt, Otto, to Dunlop Limited. Pneumatic tires. 3,899,015, Cl. 152-361.0FP.

Gebruder Junghans GmbH: *See—*
Wolber, Robert, 3,898,791.

Gehres, Thomas: *See—*
Arild, Tor; and Gehres, Thomas, 3,898,929.

Geiger, David H. Laminated fabric. 3,899,622, Cl. 428-245.000.

Geisel, Anthony; and Rohowsky, Bohdan. Ladder platform. 3,899,045, Cl. 182-121.000.

General Dynamics Corporation: *See—*
Sutherland, William M., 3,899,624.

General Electric Company: *See—*
Bredt, James H.; and Kendall, Louis F., Jr., 3,899,360.
Cline, Harvey E.; and Anthony, Thomas R., 3,899,361.
Cline, Harvey E.; and Anthony, Thomas R., 3,899,362.
Csicsatka, Antal, 3,899,743.
Dennis, Ronald E.; Treece, William D.; and Corsmeier, Robert J., 3,899,267.
Farrington, Gregory C.; Will, Fritz G.; and Lord, Peter C., 3,899,352.
Giles, Olin S.; and Lafferty, Edwin C., 3,899,747.
Grossman, Leonard N.; and Levin, Harry A., 3,899,392.
Herman, Arthur L., 3,899,739.
Insley, Gene L.; and Lewis, Merle J., 3,898,792.
Laessig, Rudolf R., 3,899,031.
Lemmond, Charles Q., 3,899,711.
Plunkett, Allan B., 3,899,725.
Sicko, John S.; Hodsoll, Raymond J., Jr.; and Adamchick, John T., 3,899,776.
Sliva, Daniel E.; Krutchen, Charles M.; and Shade, Ray W., 3,899,574.
Witting, Harald L., 3,899,712.
Yartz, Johnny W., 3,899,658.

General Foods Corporation: *See—*
Fischer, Valentine J.; Ponzoni, George Bernard; and Tressler, Charles J., 3,899,598.
Hammond, John E.; and Streckfus, Thomas K., 3,899,593.
Lack, Bryan E. C.; and Newman, Alec T., 3,899,102.

General Mills, Inc.: *See—*
Johannes, James H., 3,899,601.

General Motors Corporation: *See—*
Borlinghaus, Hans J., 3,898,824.
Johnson, John N., 3,899,182.
Johnson, Lauren L., 3,898,937.
Kobrehel, Peter M., 3,899,151.
Newbould, John; Eusebi, Elio; and Bobalek, Edward G., 3,899,462.
Schlanzky, Manfred P. H., 3,898,892.
Shellhause, Ronald L., 3,898,914.
Smith, Roy R., 3,899,656.

Gentert, Donald. Spinning lure. 3,898,757, Cl. 43-42.060.

George Kent Ltd.: *See—*
Binnie, Alexander J.; Bowdell, Kenneth; and Clark, Philip James, 3,899,774.

Georgiev, Tancho D.; and Scanzani, Robert M. Dome and vault construction. 3,898,777, Cl. 52-81.000.

Geret, Adeline, born Torcheux, heir: *See—*
Honore, Etienne Augustin Henri; Torcheux, Emile Leon Gabriel, deceased; Torcheux, Micheline Marie, born Deloffre, heir; Torcheux, Alain, heir; and Geret, Adeline, born Torcheux, heir, 3,899,769.

Gerin Corporation, The: *See—*
Gerin, Fernand L., 3,898,871.

Gerin, Fernand L., to Gerin Corporation, The. Viscosity comparator. 3,898,871, Cl. 73-57.000.

German Federal Republic, represented by the Minister for Research and Technology: *See—*
Heide, Helmut; Hoffmann, Ulrich; Brotz, Gunther; and Poeschel, Eva, 3,899,556.

Gertsch AG: *See—*
Schweizer, Gottfried; and Smolka, Thomas Gordon, 3,899,190.

Gesellschaft fur Strahlen-und Umweltforschung mbH: *See—*
Regulla, Dieter, 3,899,679.

Gewerkschaft Eisenhutte Westfalia: *See—*
Plevak, Lubomir; Bekcer, Kunibert; Wojaczek, Egon; and Holken, Norbert, 3,898,845.

Giesselmann, Hannes, to Husqvarna AB. Ejector for a winding device. 3,898,942, Cl. 112-218.00A.

Gilbert, Neal J.; and Horton, Edward L., to Enviro-Blast International. Sandblasting apparatus. 3,898,768, Cl. 51-15.000.

Gilchrist, Timothy Michael. Apparatus for feeding animals. 3,898,960, Cl. 119-51.00R.

Giles, Olin S.; and Lafferty, Edwin C., to General Electric Company. Arrangement for providing radio equipment with a plurality of oscillators. 3,899,747, Cl. 331-2.000.

Girardon, Hubert; and Emeury, Jean Marie, to Societe Nationale des Poudres et Explosifs. Preparation of 2,4,6,2',4',6'-hexanitrodiphenylamine. 3,899,536, Cl. 260-576.000.

Gladieux, Andre. Device for fixing a rotor on a rotatable shaft. 3,899,257, Cl. 403-259.000.

Glanvall, Rune, to Stal Refrigeration AB. Sliding vane rotary compressor. 3,899,271, Cl. 418-82.000.

Glass, Alastair Malcolm: *See*—
Auston, David Henry; and Glass, Alastair Malcolm, 3,899,428.

Glassmeyer, John J., to Pullman Incorporated. Testing device and method for testing containers. 3,898,873, Cl. 73-88.00R.

Gleyze, Jean, to Societe Civile Textile dite Socitex. Textile machine with device for forming a yarn reserve on a bobbin tube during the winding operation and a yarn tension sensor cooperating with the device. 3,899,140, Cl. 242-18.0PW.

Glickman, Myron: *See*—
Lanigan, John J.; Glickman, Myron; and Hehn, Anthony H., 3,899,205.

Globe-Union Inc.: *See*—
Pukaite, Clifford Joseph, 3,899,449.

Glory Kogyo Kabushiki Kaisha: *See*—
Shigemori, Hideto; Ueba, Akio; and Kitagami, Hisashi, 3,899,103.

Glynn, Thomas M.: *See*—
Fead, William A.; Glynn, Thomas M.; Sbarra, Joseph F.; and Bower, Alfred L., 3,899,278.

Gobrecht, George W.; and Reed, Robert T., to Walton Products, Inc. Car coupler. 3,899,084, Cl. 213-100.00R.

Godart, Jean; and Faure, Guy, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Methods and device for positioning and assembling free-fitting parts. 3,898,726, Cl. 29-213.000.

Goetze, Rudolf: *See*—
Dannert, Dietmar; Ihlenburg, Rainer; Nackmayr, Dietrich; Goetze, Rudolf; Kruger, Wolfgang; Peter, Hartmut; Westphal, Klaus; and Thuy, Hans-Joachim, 3,899,181.

Gogarty, William B.: *See*—
Hayes, John B.; Haws, Gerald W.; and Gogarty, William B., 3,899,431.

Goldenberg, Emmanuel; Dawans, Francois; Durand, Jean-Pierre; and Martino, Germain, to Institut Francais du Petrole des Carburants et Lubrifiants. Process for manufacturing hydrogenated polymers from conjugated diolefins. 3,899,474, Cl. 260-94.300.

Goldenberg, Marvin M.: *See*—
Alaimo, Robert J.; and Goldenberg, Marvin M., 3,899,479.

Goldstaub, Jacques B. Combination planting device. 3,898,766, Cl. 47-38.100.

Goldstein, Norman P.; and Sun, Kuan H., to Westinghouse Electric Corporation. Apparatus for power and breeding distribution measurements in breeder reactors. 3,899,676, Cl. 250-390.000.

Gomez Llona, Jose Luis; and Di Pietro Elizaran, Rodolfo, to Arteche Instrumentacion Y Sistemas Electronicos, S.A. Control device detecting signal deviations from threshold values. 3,899,690, Cl. 307-215.000.

Good, Lewis B., Jr. Pump and intensifier unit arrangement for powered tools. 3,898,805, Cl. 60-325.000.

Goodman, Robert, to RCA Corporation. Adjustable bed. 3,898,702, Cl. 5-68.000.

Goodyear Tire & Rubber Company, The: *See*—
Wilson, Joan L., 3,899,460.

Gorbanev, Arkady Alexeevich: *See*—
Borisenko, Gleb Pavlovich; Chernobrivenko, Jury Sergeevich; Kutsov, Jury Georgievich; Gorbanev, Arkady Alexeevich; Kukushkin, Oleg Nikolaevich; Krivobokov, Vladimir Nikolaevich; Pobegailo, Grigory Gavrilovich; and Nashivanko, Vitaly Dmitrievich, 3,898,830.

Gordon, Ronnie D.: *See*—
Starks, Charles M.; and Gordon, Ronnie D., 3,899,542.

Gorman, Gerald W. Method of manufacturing dynamic pressure seal. 3,899,567, Cl. 264-318.000.

Grabmaier, Josef; and Plaettner, Rolf, to Siemens Aktiengesellschaft. Method of producing a light conducting fiber having a core and a casing. 3,899,313, Cl. 65-3.000.

Grachten, Erich, to Burris Industries, Inc. Shelf assembly. 3,898,939, Cl. 108-109.000.

Graff, John P., Jr.: *See*—
Lake, John K., 3,899,424.

Granges Engineering Aktiebolag: *See*—
Hamrin, Bo Goran; and Peterson, Rune, 3,899,287.

Grant, Graham Cameron. Stroke varying mechanism. 3,898,887, Cl. 74-29.000.

Grantham, LeRoy F.: *See*—
Yosim, Samuel J.; and Grantham, LeRoy F., 3,899,322.

Grawey, Charles E.; Untz, Robert W.; and Beyers, Marvin E., to Caterpillar Tractor Co. Flexible sealed track belt. 3,899,220, Cl. 305-19.000.

Green, Glen R., to Ore-Ida Foods, Inc. Food forming apparatus. 3,899,273, Cl. 425-62.000.

Greenberg, Gerald H. Straddle fastening device. 3,898,906, Cl. 85-11.000.

Greene, Charles H., to Ohio Knife Company. Method of making drill proof plate for safes. 3,898,729, Cl. 228-122.000.

Gregan, Daniel P. Game apparatus. 3,899,176, Cl. 273-130.00R.

Greider, Charles Austin, to Townsend Engineering Company. Safety table for a skinning machine. 3,898,923, Cl. 99-589.000.

Greiner Electronic AG: *See*—
Ryser, Kurt, 3,899,785.

Grethe, Guenter; and Uskokovic, Milan Radoje, to Hoffmann-La Roche Inc. Quinuclidine-2-carboxaldehydes. 3,899,498, Cl. 260-293.530.

Greubel, Waldemar; Krueger, Hans; and Wolff, Ulrich, to Siemens Aktiengesellschaft. Liquid crystal color display system. 3,899,786, Cl. 340-336.000.

Grewe, Ferdinand: *See*—
Scholl, Hans-Joachim; Klauke, Erich; Grewe, Ferdinand; and Hammann, Ingeborg, 3,899,584.

Griffin, Robert M.: *See*—
Tartakoff, Alexander; Gutta, John J.; and Griffin, Robert M., 3,899,708.

Griffing, Brandt Mead, to International Business Machines Corporation. Brushless linear DC motor actuator. 3,899,699, Cl. 310-13.000.

Griffith, Bobby D.; and Bertram, August H., to Caterpillar Tractor Co. Gauge width adjustment means for track-type vehicles. 3,899,038, Cl. 180-9.480.

Grimaldi, David, Jr. Sheet perforator having means for reinforcing the sheet at the holes. 3,898,919, Cl. 93-1.00A.

Grimm, Hermann: *See*—
Trube, Hans; Grimm, Hermann; and Karioth, Gernot, 3,898,921.

Grobbelaar, Christian. Irrigation apparatus. 3,899,132, Cl. 239-199.000.

Groff, Richard T., to United States of America, Air Force. Paddle wheel diffuser. 3,898,910, Cl. 89-14.00C.

Grosjean, Henri: *See*—
Sigel, Pierre Louis; and Grosjean, Henri, 3,899,233.

Grosseau, Albert, to Societe Anonyme Automobiles Citroen. Disc brakes especially for automobiles. 3,899,051, Cl. 188-73.500.

Grossman, Leonard N.; and Levin, Harry A., to General Electric Company. Nuclear fuel element containing particles of an alloyed Zr, Ti and Ni getter material. 3,899,392, Cl. 176-68.000.

Groult, Pierre; Hubert, Francois; Daunay, Jacques; and Bono, Pierre, to Societe Generale de Constructions Electriques et Mecaniques Alsthom & Cie. Porous electrode for a fuel cell and method of making same. 3,899,356, Cl. 136-120.0FC.

Grow, Harlow B. Reaction motor employing intermittent explosive combustion and impulse turbine. 3,898,801, Cl. 60-247.000.

Gruppo Lepetit S.p.A.: *See*—
Coronelli, Carolina; Bardone, Maria Rosa; and Pagani, Hermes, 3,899,396.

GTE Automatic Electric Laboratories Incorporated: *See*—
Gaon, David E., 3,899,665.

GTE International: *See*—
Maier, Gerhard; and Fischer, Bertram, 3,899,758.

GTE Sylvania Incorporated: *See*—
Bennett, John E.; Jayne, Max L.; and Orbanic, Robert S., 3,898,967.
Decker, John J.; and Kerstetter, Donald R., 3,898,721.
Funston, David Lee, 3,899,760.
Tartakoff, Alexander; Gutta, John J.; and Griffin, Robert M., 3,899,708.

Gundlach, Robert W.: *See*—
Bean, Lloyd F.; and Gundlach, Robert W., 3,899,329.

Gurtner, S.A.: *See*—
Iung, Jacques, 3,898,853.

Gustafsson, Sven G.: *See*—
Unkauf, Manfred G.; Harris, Derek V.; and Gustafsson, Sven G., 3,899,740.

Gustin, Paul R. Athletic shoe cleat. 3,898,751, Cl. 36-67.00D.

Guth, Christian: *See*—
Buhler, Arthur; Schutz, Hans Ulrich; Mausezahl, Dieter; Harris, Melvin; and Guth, Christian, 3,899,469.

Gutta, John J.: *See*—
Tartakoff, Alexander; Gutta, John J.; and Griffin, Robert M., 3,899,708.

Guy, Raymond, to Bridon Limited. Treatment of steel roping wire. 3,899,365, Cl. 148-6.15R.

Gwozdz, Joseph W., to McKinney Manufacturing Company. Door hinge adjustable closing spring. 3,898,708, Cl. 16-72.000.

H. B. Zachary Co.: *See*—
Cox, Elmer Adrian; Tiner, Wayne Douglas; and Woods, Ritchey Paul, Jr., 3,898,776.

H. C. Duke & Son, Inc.: *See*—
Duke, Gene S., 3,898,859.

H.S.M. Americas Ltd.: *See*—
Lewis, Kenneth, 3,899,425.

Habiger, Cyril W., to Caterpillar Tractor Co. Hydrostatic transmission control system. 3,898,807, Cl. 60-391.000.

Haddad, George S. Brake for a snow ski. 3,899,184, Cl. 280-11.13B.

Hadzekyriakides, Nicholas S.: *See*—
Bloom, Stanley M.; and Hadzekyriakides, Nicholas S., 3,899,331.

Hahn, James H., to Interface Technology, Inc. Portable tone data transmitter. 3,899,638, Cl. 179-2.0DP.

Halasz, Andrew: *See*—
Cassai, Eugene; Halasz, Andrew; and Hanke, Edward Herman, 3,898,828.

Hall-Barkan Instruments, Inc.: *See*—
Barkan, Harold; Brayman, George E.; and Swartz, Jerome, 3,899,713.

Hall, Guy E., to Steadley Company, Inc. Machine cover. 3,899,043, Cl. 181-33.00K.

Hall, Joseph J.; and Lamb, Leo M., to Johnson & Johnson. Adhesive tape. 3,899,075, Cl. 206-411.000.

Hall, Roger P., to SCM Corporation. Curing by actinic radiation. 3,899,611, Cl. 427-54.000.

Haller, Herbert C., to Albany International Corporation. Bowling ball decelerator. 3,899,171, Cl. 273-47.000.

Haller, Jordan D. Valve having axially separable members. 3,898,999, Cl. 137-512.100.

Halpern, Donald F., to Bio-Medical Sciences, Inc. Integrity indicator. 3,899,295, Cl. 23-253.0TP.

Halvorson, George C. Duck retrieving device. 3,898,755, Cl. 43-1.000.

Hama, Tetsuro, to Kabushiki Kaisha Suwa Seikosha. Driving circuits for electronic watches. 3,899,691, Cl. 307-223.00C.

Hamm, Alton B., to Hamm Systems, Inc. Leg mounted distance measuring device and guidance system. 3,898,886, Cl. 73-432.000.

Hamm Systems, Inc.: *See*—
Hamm, Alton B., 3,898,886.

Hammann, Ingeborg: *See*—
Scholl, Hans-Joachim; Klauke, Erich; Grewe, Ferdinand; and Hammann, Ingeborg, 3,899,584.

Hammond Corporation: *See*—
Schreier, Wilford Rayburn, 3,898,905.

Hammond, John E.; and Streckfus, Thomas K., to General Foods Corporation. Xylitol chewing gum. 3,899,593, Cl. 426-3.000.

Hammond, Trevor John: *See*—
Simmons, John Richard; and Hammond, Trevor John, 3,898,890.

Hamrin, Bo Goran; and Peterson, Rune, to Granges Engineering Aktiebolag. Method of heating metallic material. 3,899,287, Cl. 432-23.000.

Hand, John James: *See*—
Spicer, Larry Dean; and Hand, John James, 3,899,583.

Hanke, Edward Herman: *See*—
Cassai, Eugene; Halasz, Andrew; and Hanke, Edward Herman, 3,898,828.

Hanna, Samuel C.; and Krupick, Walter J., to Singer Company, The. Torquer armature. 3,899,702, Cl. 310-67.000.

Hansen, Carlo J.: *See*—
Miller, Timothy A.; and Hansen, Carlo J., 3,899,607.

Hansen, Howard C., to Clark Equipment Company. Coupling electric line inside of fluid conduit. 3,899,046, Cl. 187-9.00E.

Hansen, Leslie T., to Sweco, Inc. Drilling mud separation system. 3,899,414, Cl. 209-17.000.

Hansford, Rowland C., to Union Oil Company of California. Rejuvenation of damaged zeolite-supported metal catalysts. 3,899,441, Cl. 252-411.00R.

Haraway, William H., Jr.; Dale, Walter J.; and McErlean, Edwin A., to United States of America, General Counsel-Code GP. Bonding method in the manufacture of continuous regression rate sensor devices. 3,898,730, Cl. 29-613.000.

Hardtmann, Goetz E., to Sandoz, Inc. Process for preparing imidazo-[2,1-a]isoindoles. 3,899,507, Cl. 260-309.600.

Hargrave, Richard D.: *See*—
Vaughn, George A.; and Hargrave, Richard D., 3,899,172.

Harig, Friedrich, to Pampus KG, Firma. Metal lining. 3,899,227, Cl. 308-237.00R.

Harman, Marion W., to Monsanto Company. 1,2,4-Thiadiazol-3,5-diyl-sulfenamides. 3,899,502, Cl. 260-302.0SD.

Harmony Emitter Company, Inc.: *See*—
Harmony, Richard C., 3,899,136.

Harmony, Richard C., to Harmony Emitter Company, Inc. Emitter for irrigation systems. 3,899,136, Cl. 239-534.000.

Harris, Deane F.: *See*—
Byrd, David J.; and Harris, Deane F., 3,898,698.

Harris, Derek V.: *See*—
Unkauf, Manfred G.; Harris, Derek V.; and Gustafsson, Sven G., 3,899,740.

Harris, James A.: *See*—
Berni, Ralph J.; and Harris, James A., 3,899,289.

Harris, Melvin: *See*—
Buhler, Arthur; Schutz, Hans Ulrich; Mausezahl, Dieter; Harris, Melvin; and Guth, Christian, 3,899,469.

Harrison, Brian G., to Minnesota Mining and Manufacturing Company. Method of making a closed end tube. 3,899,325, Cl. 75-208.00R.

Harrison, John R.: *See*—
Bredeson, Dean K.; Harrison, John R.; and Johnson, Earl A. N., 3,899,301.

Harsco Corporation: *See*—
Lang, David, 3,899,265.

Hart, Joseph J.: *See*—
Andrews, Richard E.; Desmond, John D.; and Hart, Joseph J., 3,899,125.
Desmond, John D.; and Hart, Joseph J., 3,899,124.

Hartley, Robert R.: *See*—
Stallworth, Lewis A.; and Hartley, Robert R., 3,898,878.

Hartmann, Lester M.: *See*—
Rothert, Kenneth; Dexter, Donald D.; and Hartmann, Lester M., 3,899,432.

Harwood, Robert George: *See*—
Yeager, Marvin Leo; Henschen, Homer Ernst; and Harwood, Robert George, 3,899,234.

Harzer, Peter, to Wandel u. Goltermann. System for measuring group delay and/or attenuation in closed signal-transmission loop. 3,899,738, Cl. 325-2.000.

Hashimoto, Akio: *See*—
Miya, Bunji; Kasutani, Katsuji; Matsuda, Morio; Hashimoto, Akio; Nisigawa, Shiyozo; and Sawamoto, Youzi, 3,899,446.

Hashimoto, Masanao; and Ohnuma, Kiyoshi, to Director-General of the Agency of Industrial Science and Technology. Speed change controlling device in an automatic transmission for an electric car. 3,898,893, Cl. 74-859.000.

Hashimoto, Tadanori: *See*—
Yamada, Koichi; Hashimoto, Tadanori; and Nakano, Kazuhiko, 3,899,571.

Hatanaka, Kazunari: *See*—
Nakagami, Takakiyo; Hatanaka, Kazunari; and Ishizaki, Masayuki, 3,899,757.

Haubner, Georg, to Robert Bosch G.m.b.H. Ignition system for an internal combustion engine with automatic timing shift. 3,898,972, Cl. 123-148.00E.

Haueter, Carl R.: *See*—
Aston, Owen, 3,899,737.

Haug, Werner Otto: *See*—
Feicht, Erwin; Haug, Werner Otto; Remshardt, Rolf; and Schettler, Helmut, 3,899,777.

Haverkamp, Wilhelm, to Heinrich Koppers Gesellschaft mit beschrankter Haftung. Arrangement for viewing the interior of a pressure vessel. 3,899,243, Cl. 350-319.000.

Hawkins, Jerry D.: *See*—
Holk, Albert J., Jr.; and Hawkins, Jerry D., 3,898,944.

Hawkins, Ronald G., to Aluminum Company of America. Preshaped wire rod and spacer having increased leverage and gripping force. 3,899,629, Cl. 174-40.00R.

Haws, Gerald W.: *See*—
Hayes, John B.; Haws, Gerald W.; and Gogarty, William B., 3,899,431.

Hayashibara Company: *See*—
Miyake, Toshio; and Sato, Yoshinori, 3,899,604.

Hayes, John B.; Haws, Gerald W.; and Gogarty, William B., to Marathon Oil Company. Oil-in-water microemulsion drilling fluids. 3,899,431, Cl. 252-8.50P.

Hayner, Paul F., to Sanders Associates, Inc. Open center, pressure demand flow control valve. 3,899,002, Cl. 137-625.620.

Heaviside, Robert D.: *See*—
Peyser, Harry A.; and Heaviside, Robert D., 3,899,117.

Hebert, Joseph M.: *See*—
Keilin, Bertram; and Hebert, Joseph M., 3,899,421.

Hecht, Stephen S.: *See*—
Rothman, Edward S.; Hecht, Stephen S.; and Moore, Gordon G., 3,899,290.

Hehn, Anthony H.: *See*—
Lanigan, John J.; Glickman, Myron; and Hehn, Anthony H., 3,899,205.

Heide, Helmut; Hoffmann, Ulrich; Brotz, Gunther; and Poeschel, Eva, to German Federal Republic, represented by the Minister for Research and Technology. Process for producing implantable, porous, ceramic, bone substitution, bone connection or prosthesis anchoring materials. 3,899,556, Cl. 264-44.000.

Heil, Werner, to BBC Aktiengesellschaft Brown Boveri & Cie. Shrinkring commutator segment assembly. 3,899,705, Cl. 310-235.000.

Heilmayr, Peter F., to Certain-teed Products Corporation. Method of making plastic siding. 3,899,561, Cl. 264-151.000.

Heinrich, Ernst: *See*—
Fleckenstein, Erwin; Mohr, Reinhard; and Heinrich, Ernst, 3,899,478.

Heinrich Koppers Gesellschaft mit beschrankter Haftung: *See*—
Coenders, Willi; and Trockel, Franz, 3,899,197.
Haverkamp, Wilhelm, 3,899,243.

Heinze, Alex E.: *See*—
Abram, Stewart J.; Denis, David R.; Heinze, Alex E.; Johnson, Leonard M.; and Taylor, Edward, 3,899,165.

Heinzer, Hans, to Sig Schweizerische Industrie-Gesellschaft. Rotary transfer apparatus for grouping articles. 3,899,069, Cl. 198-25.000.

Heithoff, Robert B., to PPG Industries, Inc. Glass batch log control device and method for using. 3,899,317, Cl. 65-135.000.

Heitz, Walter Helmut. Door lock. 3,899,203, Cl. 292-335.000.

Helka S.A.: *See*—
Mieville, Andre, 3,899,261.

Hemphill, Geoffrey: *See*—
Skov, Ebbe R.; Judge, Roderick B.; and Hemphill, Geoffrey, 3,899,588.

Hendrickson, Richard T.; Lewis, Richard L.; Ewald, Jerome T.; Bach, Lloyd G.; and Hickner, George B., to Bendix Corporation, The. Solenoid control valve for hydraulic brake booster. 3,898,913, Cl. 91-31.000.

Henkel & Cie GmbH: *See*—
Schindler, Norbert; and Ploger, Walter, 3,899,496.

Henning, Wolfgang: *See*—
Beaver, Ruby C.; Clasen, Theodor; Henning, Wolfgang; and Johnson, Emil S., 3,899,734.

Henry, Donald E. Means for preparing cells for inspection. 3,899,610, Cl. 427-2.000.

Henschen, Homer Ernst: *See*—
Yeager, Marvin Leo; Henschen, Homer Ernst; and Harwood, Robert George, 3,899,234.

Herbetko, Stephen A., to Connelly Containers, Inc. Interlocking container. 3,899,121, Cl. 229-34.00R.

Hercules Incorporated: *See*—
Mahlman, Bert H., 3,899,439.

Herman, Arthur L., to General Electric Company. Decode squelch circuit for a continuous tone control radio receiver. 3,899,739, Cl. 325-319.000.

Hess, Howard V.: *See*—
Cole, Edward L.; and Hess, Howard V., 3,899,398.

Hesston Corporation: *See*—
Bedwell, Thomas A.; and Call, Bruce L., 3,899,066.

Hickner, George B.: *See*—
Hendrickson, Richard T.; Lewis, Richard L.; Ewald, Jerome T.; Bach, Lloyd G.; and Hickner, George B., 3,898,913.

Higashida, Susumu: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 3,899,464.

Hikota, Toyohiko: *See*—
Okazaki, Kaoru; Yagi, Kenkichi; Okamoto, Miyoshi; Watanabe, Koji; Hikota, Toyohiko; and Kubo, Masayoshi, 3,899,292.

Hilgers, Raymond H.; and Liautaud, James P., to Capsonic Group, Inc. Insert frame for insert molding. 3,899,305, Cl. 29-193.000.

Hill, Roland John; and Jewell, Norman Thomas, to Rolls-Royce Limited. Gas dynamic lasers. 3,899,749, Cl. 331-94.50P.

Hillis, Maurice Raymond: *See*—
Francis, Peter Douglas; Redford, Ronald Albert; Gale, Philip Franklin; and Hillis, Maurice Raymond, 3,899,685.

Hillman, Edwin K. Wind-driven motive apparatus. 3,899,268, Cl. 416-117.000.

Himeno, Shohachi, to Conde Kabushiki Kaisha. Knife for cutting out clippings. 3,898,735, Cl. 30-294.000.

Hines, Marion E.; and Benz, Konrad K., to Microwave Associates, Inc. Electric wave resonators. 3,899,759, Cl. 333-73.00W.

Hino, Naganori: *See*—
Tanaka, Shizuya; Ozaki, Toshiaki; Mine, Akihiko; Tanaka, Katsutoshi; Yamamoto, Sigeo; Ooishi, Tadashi; Hino, Naganori; and Satomi, Takeo, 3,899,582.

Hioki Electric Works Co., Ltd.: *See*—
Sakaguchi, Takehiko, 3,899,736.

Hirano, Masachika: *See*—
Okuno, Yoshitoshi; and Hirano, Masachika, 3,899,586.

Hirose, Masao: *See*—
Syoji, Masaaki; Ishihara, Goro; Hirose, Masao; Kubota, Hidenobu; and Mitani, Naoyuki, 3,899,530.

Hirs, Gene, to Hydromation Filter Company. Apparatus and method for filter seal. 3,899,426, Cl. 210-387.000.

Hirschfeld, Tomas, to Block Engineering, Inc. Biological staining technique and mixture thereof. 3,899,297, Cl. 23-230.00B.

Hirt, John H., to Southern California Gas Co. Electric arc furnace with auxiliary burners. 3,899,628, Cl. 13-2.000.

Hitachi, Ltd.: *See*—
Kishi, Tuneo; and Nakano, Seizo, 3,899,650.
Kominami, Yasuo, 3,899,744.
Komiyama, Shigeo; Matsubara, Ichiro; and Shiraishi, Masatake, 3,899,386.
Masai, Tadahisa; Adachi, Tetsuro; Sasaki, Shigeru; and Moriyama, Kazuyoshi, 3,899,266.
Yamauchi, Masaaki, 3,899,761.

Hitachi Metals, Ltd.: *See*—
Sekimoto, Yasuhiro; and Miura, Yoshitada, 3,899,020.

Hochuli, Urs E. Long life gas laser system and method. 3,899,750, Cl. 331-94.50G.

Hochuli, Urs E. Long life molecular gas laser. 3,899,751, Cl. 331-94.50T.

Hodges, James T., Jr.; Braddock, John B.; and Dishman, George C., to Sonoco Products Company. Roll tightener. 3,899,142, Cl. 242-67.10R.

Hodsoll, Raymond J., Jr.: *See*—
Sicko, John S.; Hodsoll, Raymond J., Jr.; and Adamchick, John T., 3,899,776.

Hoechst Aktiengesellschaft: *See*—
Fernholz, Hans; Wunder, Friedrich; and Schmidt, Hans-Joachim, 3,899,539.
Fleckenstein, Erwin; Mohr, Reinhard; and Heinrich, Ernst, 3,899,478.
Horlein, Gerhard; Langeluddeke, Peter; Schonowsky, Hubert; and Studeneer, Adolf, 3,899,489.
Riemenschneider, Wilhelm, 3,899,509.
Schwartz, Gunther; and Frank, Klaus, 3,899,416.
Siegemund, Gunter, 3,899,531.
von der Elitz, Hans-Ulrich, 3,899,291.

Hoehn, Harvey Herbert; and Richter, John W., to du Pont de Nemours, E. I., and Company. Aromatic polyimide, polyester and polyamide separation membranes. 3,899,309, Cl. 29-16.000.

Hoerner Waldorf Corporation: *See*—
Roccaforte, Harry I., 3,899,119.
Seiter, George M., 3,899,079.

Hofert, Paul: *See*—
Arzi, Friedrich; Hofert, Paul; and Sudler, Roland, 3,898,789.

Hoffer, Max, to Hoffmann-La Roche Inc. 2,2′-Anhydro-1-β-D-arabinofuranosyl-5-fluorocytosine salts and process 2. 3,899,482, Cl. 260-211.50R.

Hoffmann-La Roche Inc.: *See*—
Grethe, Guenter; and Uskokovic, Milan Radoje, 3,899,498.
Hoffer, Max, 3,899,482.

Hoffmann, Ulrich: *See*—
Heide, Helmut; Hoffmann, Ulrich; Brotz, Gunther; and Poeschel, Eva, 3,899,556.

Hoffmann, Yngve Birger Lowenhaupt, to AB Pellerin/Zenith. Apparatus for continuous acid treatment of soapstock. 3,899,440, Cl. 252-371.000.

Hoffmeister, Bernhard: *See*—
Flessner, Hinrich; and Hoffmeister, Bernhard, 3,899,083.

Hoganas AB, Fack: *See*—
Lindskog, Per Folke; Arbstedt, Per Gunnar; and Wastenson, Erik Goran, 3,899,319.

Holk, Albert J., Jr.; and Hawkins, Jerry D., to Continental Can Company, Inc. Score and tool for forming the score. 3,898,944, Cl. 113-1.00F.

Holken, Norbert: *See*—
Plevak, Lubomir; Bekcer, Kunibert; Wojaczek, Egon; and Holken, Norbert, 3,898,845.

Holleran, Louis M.: *See*—
Frost, Rodney I.; and Holleran, Louis M., 3,899,326.

Hollinger, Paul, to Maryland Cup Corporation. Self-dispensing dispenser. 3,899,118, Cl. 229-17.00B.

Hollister Incorporated: *See*—
Nolan, John L., 3,898,990.

Hollnagel, Harold E. Snowmobile ski suspension assembly. 3,899,036, Cl. 180-5.00R.

Hollymatic Corporation: *See*—
Wagner, Richard C., 3,898,863.

Holtz, Hans D., to Phillips Petroleum Company. Producing benzophenone and related products. 3,899,537, Cl. 260-591.000.

Holtz, Roger Edward: *See*—
Cobb, Douglas Romain; Holtz, Roger Edward; and Trimble, David Carlaw, 3,899,646.

Homma, Yasuo: *See*—
Misato, Tomomasa; Huang, Keng Tang; Homma, Yasuo; Yoshida, Ryonosuke; Saito, Tadaomi; and Shimizu, Akira, 3,899,585.

Honig, Gunther; and Kiencke, Uwe, to Robert Bosch G.m.b.H. Control system and devices for internal combustion engines. 3,898,962, Cl. 123-32.0EA.

Honnell, Martial A.: *See*—
United States of America, National Aeronautics and Space Administration; and Honnell, Martial A., 3,899,745.

Honore, Etienne Augustin Henri; Torcheux, Emile Leon Gabriel, deceased; by Torcheux, Micheline Marie, born Deloffre, heir; Torcheux, Alain, heir; and Geret, Adeline, born Torcheux, heir, to Societe d'Etude et d'Application des Techniques Nouvelles NEO-TEC. Method of and apparatus for representing the movement of a moving body in a two-dimensional space. 3,899,769, Cl. 340-24.000.

Hooker Chemicals & Plastics Corporation: *See*—
Cook, Edward H., Jr.; and Emery, Alvin T., 3,899,403.
Evans, Leo G.; and Ruthel, Walter W., 3,899,408.
Schultz, Robert F.; and Cook, Edward H., Jr., 3,899,409.

Hoover Ball and Bearing Company: *See*—
Wiese, Delmar R., 3,899,095.

Hopkins, Evan Lloyd; and Hopkins, Ross Eugene, to Hopkins Manufacturing Company. Indoor/outdoor thermometer. 3,898,884, Cl. 73-339.00C.

Hopkins Manufacturing Company: *See*—
Hopkins, Evan Lloyd; and Hopkins, Ross Eugene, 3,898,884.

Hopkins, Ross Eugene: *See*—
Hopkins, Evan Lloyd; and Hopkins, Ross Eugene, 3,898,884.

Hoppe, Walter, to Max-Planck-Gesellschaft ZUR Forderung der Wissenshaften e.V. Apparatus for maintaining high precision in a rotating device used with optical apparatus. 3,899,728, Cl. 318-687.000.

Hori, Yutaka; Yoshikawa, Nobuharu; and Ohmori, Saburo, to Nitto Electric Industrial Co., Ltd. Plastic for indicating a radiation dose. 3,899,677, Cl. 250-474.000.

Horiuchi, Hideo: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 3,899,464.

Horizons Incorporated: *See*—
Lewis, James M., 3,899,338.

Horlein, Gerhard; Langeluddeke, Peter; Schonowsky, Hubert; and Studeneer, Adolf, to Hoechst Aktiengesellschaft. Hexahydrotriazinone derivatives. 3,899,489, Cl. 260-248.0NS.

Horst, Jager, to Bayer Aktiengesellschaft. Water-soluble phthalocyanine reactive dyestuffs containing an ethylsulfonyl substituent. 3,899,486, Cl. 260-239.600.

Horton, Edward L.: *See*—
Gilbert, Neal J.; and Horton, Edward L., 3,898,768.

Hotten, Bruce W., to Chevron Research Company. Extreme pressure lubrication additive. 3,899,475, Cl. 260-97.500.

Huang, Keng Tang: *See*—
Misato, Tomomasa; Huang, Keng Tang; Homma, Yasuo; Yoshida, Ryonosuke; Saito, Tadaomi; and Shimizu, Akira, 3,899,585.

Huang, Patrick Chin-Sheng: *See*—
Esch, Ronald Philip; and Huang, Patrick Chin-Sheng, 3,899,372.

Huba, Francis; and Banner, Robert G., to Diamond Shamrock Corporation. Continuous saccharin process. 3,899,501, Cl. 260-301.000.

Hubert, Francois: *See*—
Groult, Pierre; Hubert, Francois; Daunay, Jacques; and Bono, Pierre, 3,899,356.

Hudson, Jimmie E.; and Dean, Jimmie L., to Phillips Petroleum Company. Blow molding apparatus. 3,899,279, Cl. 425-387.00B.

Hudson Pulp & Paper Corporation: *See—*
Zucker, Jerry, 3,898,920.
Huff, Thomas R. Mast handling. 3,898,948, Cl. 114-91.000.
Hughes, Francis H.: *See—*
Crawford, Douglas J.; LeMere, Roger; and Hughes, Francis H., 3,898,941.
Hunnicutt, Wayne E. Headlight testing apparatus. 3,898,742, Cl. 33-288.000.
Hunt, Theodore R., to Data Time, Inc. AC/DC-monitoring telephone line ringing voltage detector. 3,899,644, Cl. 179-84.00R.
Hunter, Willard L.; White, Jack C.; and Stickney, William A., to United States of America, Interior. Preparation of highly pure titanium tetrachloride from ilmenite slag. 3,899,569, Cl. 423-76.000.
Huntress, Howard B.; and Novotny, Raymond J., to Abex Corporation. Disc brakes with cooling rods. 3,899,054, Cl. 188-218.0XL.
Husqvarna AB: *See—*
Giesselmann, Hannes, 3,898,942.
Hutchins, Walter J. Portable insulated carrier for containers. 3,899,098, Cl. 220-4.00B.
Huvers, Marius E. Selective braking assembly. 3,899,048, Cl. 188-16.000.
Hydromation Filter Company: *See—*
Hirs, Gene, 3,899,426.
I-T-E Imperial Corporation: *See—*
Keating, John H.; and Chase, Alfred E., Jr., 3,899,101.
Ichiko Industries Limited: *See—*
Tanaka, Morimasa, 3,899,154.
Ichimura, Akira: *See—*
Okazaki, Kaoru; Yagi, Kenkichi; Ichimura, Akira; and Masubuchi, Yoshinori, 3,899,623.
Ichinose, Noboru; and Yokomizo, Yuhji, to Tokyo Shibaura Electric Co., Ltd. Oxide varistor. 3,899,451, Cl. 252-520.000.
Identicon Corporation: *See—*
Jones, Paul W., 3,899,687.
IDN Inventions and Development of Novelties AG: *See—*
Ackeret, Peter, 3,899,229.
Ihlenburg, Rainer: *See—*
Dannert, Dietmar; Ihlenburg, Rainer; Nackmayr, Dietrich; Goetze, Rudolf; Kruger, Wolfgang; Peter, Hartmut; Westphal, Klaus; and Thuy, Hans-Joachim, 3,899,181.
Ikegame, Mamoru: *See—*
Sasaki, Rentaro; Watanabe, Akinori; Ikegame, Mamoru; and Ogasawara, Tatsuo, 3,899,707.
Ikegami, Yoshizo; and Fukeda, Susumu, to Fuji Photo Film Co., Ltd. Printer for embossed card. 3,898,930, Cl. 101-316.000.
Ikuno, Yuji; and Kato, Yutaka, to Olympus Optical Co., Ltd. Electrosurgical apparatus and method of operating same. 3,898,991, Cl. 128-303.140.
Illinois Tool Works Inc.: *See—*
Marco, Leslie Stephan, 3,899,096.
Immel, Otto; and Schwarz, Hans Helmut, to Bayer Aktiengesellschaft. Process for the purification of caprolactam. 3,899,485, Cl. 260-239.30A.
Imperial Chemical Industries Limited: *See—*
Birchall, James Derek; Cassidy, John Edward; Rolfe, Nicholas; and Miles, Clifford Granville, 3,899,342.
Bird, Margaret Ellen; and Senior, Norman, 3,899,578.
Colchester, John Edward; and Blundell, Thomas, 3,899,499.
Colchester, John Edward; and Blundell, Thomas, 3,899,500.
Rowe, Frederick; Norton, Michael George; and Fairweather, John Anthony, 3,899,412.
Inada, Isamu: *See—*
Minai, Kiichi; Inada, Isamu; Ozawa, Kenji; and Okochi, Kenji, 3,899,435.
Inayama, Takayuki, to Fuji Photo Film Co., Ltd. Static charge preventing method for acetylcellulose moldings. 3,899,613, Cl. 427-133.000.
Industrie Pirelli S.p.A.: *See—*
Ferrentino, Antonio, 3,898,727.
Robecchi, Edoardo; and Tavazza, Giuseppe, 3,899,014.
Ing. C. Olivetti & C., S.p.A.: *See—*
Ravera, Giovanni; and Siletto, Giorgio, 3,899,792.
Ingrao, Hector C.: *See—*
Fantasia, John F.; and Ingrao, Hector C., 3,899,213.
Insley, Gene L.; and Lewis, Merle J., to General Electric Company. Digital timer. 3,898,792, Cl. 58-39.500.
Institut Francais du Petrole des Carburants et Lubrifiants: *See—*
Cosyns, Jean; Franck, Jean-Pierre; and Le Page, Jean-Francois, 3,899,543.
Goldenberg, Emmanuel; Dawans, Francois; Durand, Jean-Pierre; and Martino, Germain, 3,899,474.
Sugier, Andre, 3,899,577.
Interface Technology, Inc.: *See—*
Hahn, James H., 3,899,638.
International Business Machine Corporation: *See—*
Jones, Ivor; Muller, Hans Rudolf; Wild, Daniel; and Zafiropulo, Pitro Alois, 3,899,642.
International Business Machines Corporation: *See—*
Antipov, Igor, 3,899,373.
Craig, David R.; Lederle, George M.; and Plante, Franklin T., 3,899,369.
Dennard, Robert H.; Rideout, Vincent L.; and Walker, Edward J., 3,899,363.
Esch, Ronald Philip; and Huang, Patrick Chin-Sheng, 3,899,372.
Feicht, Erwin; Haug, Werner Otto; Remshardt, Rolf; and Schettler, Helmut, 3,899,777.
Gabor, Dennis, 3,899,240.
Griffing, Brandt Mead, 3,899,699.
Kaiser, Harold D.; and Nufer, Robert W., 3,899,554.
Malaviya, Shashi D., 3,899,753.
Malozemoff, Alexis Plato, 3,899,779.
Peters, Henry G., Jr.; and Schuessler, Philipp W. H., 3,899,339.
International Equipment Company: *See—*
Joyce, John E., 3,899,128.
International Flavors & Fragrances Inc.: *See—*
Mookherjee, Braja Dulal; Vock, Manfred Hugo; Benaim, Carlos; and Shuster, Edward J., 3,899,597.
International Harvester Company: *See—*
Connelly, John J., 3,898,838.
International Standard Electric Corporation: *See—*
Esser, Karl; Friedrich, Robert; and Segain, John E., 3,899,327.
Tabalba, Camilo Manansala, 3,899,643.
International Telephone and Telegraph Corporation: *See—*
Dashner, James W., 3,899,196.
ISC Alloys Limited: *See—*
Swanson, Colin John, 3,898,827.
Isenhower, Bonnie J., executrix: *See—*
Isenhower, Robert H., deceased; Isenhower, Bonnie J., executrix; and Garman, David M., 3,898,908.
Isenhower, Robert H., deceased; by Isenhower, Bonnie J., executrix; and Garman, David M. Inertia bullet puller. 3,898,908, Cl. 86-1.00A.
Ishida, Fujio: *See—*
Takamune, Hirotoki; and Ishida, Fujio, 3,898,790.
Ishihara, Goro: *See—*
Syoji, Masaaki; Ishihara, Goro; Hirose, Masao; Kubota, Hidenobu; and Mitani, Naoyuki, 3,899,530.
Ishihara, Hideo: *See—*
Watanabe, Teruji; and Ishihara, Hideo, 3,899,781.
Ishikawa, Yoshikazu: *See—*
Iwata, Hiroyoshi; Sekiguchi, Koichi; and Ishikawa, Yoshikazu, 3,898,963.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Furuya, Shoji; Takahashi, Masaoki; and Matsushima, Masatoshi, 3,899,088.
Ishizaki, Masayuki: *See—*
Nakagami, Takakiyo; Hatanaka, Kazunari; and Ishizaki, Masayuki, 3,899,757.
Itek Corporation: *See—*
Berman, Elliot; and Ekman, Carl F. W., 3,899,333.
Ito, Tadashi: *See—*
Taguchi, Tatsuya; Uchiyama, Takashi; Nakamoto, Soichi; and Ito, Tadashi, 3,899,789.
Ito, Yoshiji: *See—*
Izumi, Soichi; Ashiura, Takeo; Ito, Yoshiji; and Miura, Nobutaka, 3,899,625.
IU Technology Corporation: *See—*
Minnick, Leonard John; Webster, William C.; and Smith, Charles L., 3,899,345.
Iung, Jacques, to Gurtner, S.A. Method and device for supplying gas under pressure from a storage tank containing the said gas in liquefied state. 3,898,853, Cl. 62-55.000.
Iverson, Marlowe L., to Rockwell International Corporation. Method of removing mercury from an aqueous solution. 3,899,404, Cl. 204-146.000.
Iverson, Marlowe L.; and McCoy, Lowell R., to Rockwell International Corporation. Method of removing heavy metals from water and apparatus therefor. 3,899,405, Cl. 204-149.000.
Iwata, Hiroyoshi; Sekiguchi, Koichi; and Ishikawa, Yoshikazu, to Nissan Motor Company Limited. Electronically controlled fuel injection system for rotary internal combustion engines. 3,898,963, Cl. 123-32.0EA.
Izumi, Soichi; Ashiura, Takeo; Ito, Yoshiji; and Miura, Nobutaka, to Nippon Steel Corporation. Sheet metal treated with lubricant for press work. 3,899,625, Cl. 428-457.000.
Izumi, Zenzi: *See—*
Aya, Toshihiko; Chiba, Kazumasa; and Izumi, Zenzi, 3,899,472.
J. Bobst & Fils S.A.: *See—*
Luska, Zdenek, 3,899,686.
J. Eberspacher: *See—*
Gaysert, Gerhard, 3,899,303.
J. I. Case Company: *See—*
Seaberg, David H., 3,898,811.
J. Uriach & Cia S.A.: *See—*
Agusti, Agustin, 3,899,581.
Jackovitz, John F.; and Pantier, Earl A., to Westinghouse Electric Corporation. Method of preparing high capacity nickel electrode powder. 3,899,350, Cl. 136-29.000.
Jacobs, William R.: *See—*
Yum, Dooho; Mercola, Peter A.; and Jacobs, William R., 3,899,742.
Jacobsen Manufacturing Company: *See—*
Figura, William L., 3,899,040.
Jacobson, Kenneth F.: *See—*
Lawrence, Manuel P.; and Jacobson, Kenneth F., 3,899,418.
Jacobson, Kent L., to Dick Tyrrell Jewelers, Inc. Locket having cover of locally compressible plastic retained by means which minimizes retaining contact therewith. 3,898,870, Cl. 63-18.000.
Jakel, Gus R., to California Cement Shake Co., Inc. Fiber reinforced concrete products and their formation. 3,899,344, Cl. 106-99.000.

Jakobs, Willy, to Klockner-Humboldt-Deutz Aktiengesellschaft. Vibrator apparatus, especially for producing large shaped carbon members. 3,899,281, Cl. 425-432.000.
Japan Atomic Energy Research Institute: *See*—
Nozawa, Masao; Yasuno, Takehiko; Yamaguchi, Takashi; and Uenoyama, Hiroshi, 3,899,420.
Japan Gasoline Co., Ltd.: *See*—
Nozawa, Masao; Yasuno, Takehiko; Yamaguchi, Takashi; and Uenoyama, Hiroshi, 3,899,420.
Jauhiainen, Toivo Untamo, to SKF Industrial Trading and Development B.V. Adjustable socket wrench. 3,898,897, Cl. 81-114.000.
Jaworski, Stefan: *See*—
Zadrozny, Jan; Kobylinski, Lech; and Jaworski, Stefan, 3,898,946.
Jayne, Max L.: *See*—
Bennett, John E.; Jayne, Max L.; and Orbanic, Robert S., 3,898,967.
Jenkins, Bernard M., to C. B. Kaupp & Sons, Inc. Inertial impact switch with normally centered, conductive oscillating contact. 3,899,649, Cl. 200-61.510.
Jenkins, Jerold D. Method of cleaning and stimulating a water well. 3,899,027, Cl. 166-302.000.
Jensen, Philip W., to Luhr Jensen & Sons, Inc. Trolling planar resettable below the surface of the water. 3,898,759, Cl. 43-43.130.
Jesse, Edwin L., to Evans Products Company. Ejector apparatus for molding machine. 3,899,282, Cl. 425-444.000.
Jewell, Norman Thomas: *See*—
Hill, Roland John; and Jewell, Norman Thomas, 3,899,749.
Jintan Terumo Co., Ltd.: *See*—
Katsuda, Itsurou, 3,898,982.
Johannes, James H., to General Mills, Inc. Dry mix for glazed cake. 3,899,601, Cl. 426-554.000.
Johansson, Bernt Eric, to Kemanord AB. Method of incorporating solid additives into vinyl chloride polymers. 3,899,473, Cl. 260-92.80W.
Johansson, Gert Arne, to AB Modern Modell. Clothing data system. 3,898,754, Cl. 40-322.000.
Johnanson, Fred E.; and Watkins, William L., to MacMillan Bloedel Research Limited. Method of manufacturing waferboard. 3,899,559, Cl. 264-115.000.
Johnson, Earl A. N.: *See*—
Bredeson, Dean K.; Harrison, John R.; and Johnson, Earl A. N., 3,899,301.
Johnson, Emil S.: *See*—
Beaver, Ruby C.; Clasen, Theodor; Henning, Wolfgang; and Johnson, Emil S., 3,899,734.
Johnson, Gordon W. Handline snatch block. 3,899,158, Cl. 254-194.000.
Johnson, Jarl. Electric heating device for internally cooking a meat product. 3,899,657, Cl. 219-523.000.
Johnson, John N., to General Motors Corporation. High temperature seal. 3,899,182, Cl. 277-96.00R.
Johnson & Johnson: *See*—
Hall, Joseph J.; and Lamb, Leo M., 3,899,075.
Johnson, Lauren L., to General Motors Corporation. Wheel slip sensing and control system. 3,898,937, Cl. 105-61.000.
Johnson, Leonard M.: *See*—
Abram, Stewart J.; Denis, David R.; Heinze, Alex E.; Johnson, Leonard M.; and Taylor, Edward, 3,899,165.
Johnson, Wayne F.: *See*—
Mailen, James C.; and Johnson, Wayne F., 3,899,296.
Johnson, William L.: *See*—
Kolenik, Steve A.; and Johnson, William L., 3,898,994.
Johnston, James V., to United States of America, Army. Constant precessed gyrocompass. 3,898,744, Cl. 33-324.000.
Jones, Charles H., to Westinghouse Electric Corporation. Imaging system. 3,899,767, Cl. 340-3.00R.
Jones, Christopher Robin: *See*—
Williams, Malcolm; Jones, Christopher Robin; and Crookes, Richard William, 3,898,969.
Jones, Harold G.: *See*—
McSheehy, Richard Y.; and Jones, Harold G., 3,898,854.
Jones, Ivor; Muller, Hans Rudolf; Wild, Daniel; and Zafiropulo, Pitro Alois, to International Business Machine Corporation. Method of distributing tone and alerting signals in a TDM communication system. 3,899,642, Cl. 179-18.00J.
Jones, Paul W., to Identicon Corporation. Optical label scanning. 3,899,687, Cl. 250-568.000.
Joseph Lucas (Industries) Limited: *See*—
Capewell, Terence John; and Craven, Donald, 3,898,817.
Simmons, John Richard; and Hammond, Trevor John, 3,898,890.
Jos. Schneider & Co. Optische Werke Kreuznach: *See*—
Bernhardt, Helmuth, 3,899,245.
Faller, Werner, 3,899,247.
Jovanovics, Karolina; Szasz, Kalman; Fekete, Gyorgy; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, to Richter Gedeon Vegyeszeti Gyar R.T. Chromic acid oxidation of vinblastine sulfate to form vincristine. 3,899,493, Cl. 260-287.00P.
Joyce, John E., to International Equipment Company. Zonal centrifuge rotors. 3,899,128, Cl. 233-32.000.
Judge, Roderick B.: *See*—
Skov, Ebbe R.; Judge, Roderick B.; and Hemphill, Geoffrey, 3,899,588.
Jungmann, Axel: *See*—
Dorner, Heinrich; Scholz, Manfred; and Jungmann, Axel, 3,899,393.
Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho: *See*—
Okada, Nobuhiko; and Suzuki, Teruaki, 3,899,139.
Kabushiki Kaisha Ricoh: *See*—
Kaneko, Tamaki, 3,898,928.
Kabushiki Kaisha Suwa Seikosha: *See*—
Hama, Tetsuro, 3,899,691.
Kahlefeld, Karl W., to Loomis Products Company. Extrusion apparatus. 3,898,831, Cl. 72-263.000.
Kai, Takayuki: *See*—
Okamoto, Tsuyoshi; Kawaguchi, Yoichi; and Kai, Takayuki, 3,899,614.
Kaiser, Harold D.; and Nufer, Robert W., to International Business Machines Corporation. Process for forming a ceramic substrate. 3,899,554, Cl. 264-41.000.
Kajimoto, Tsunesuke; and Wakamatsu, Shigeru, to Toray Industries, Inc. Catalyst for oxidation of ethylene to ethylene oxide. 3,899,445, Cl. 252-462.000.
Kajitani, Mitsuo: *See*—
Ueno, Yoshito; Kajitani, Mitsuo; and Ohgushi, Yoshio, 3,899,429.
Kalil, James, to du Pont de Nemours, E. I., and Company. Simultaneous reaction and dispersion of 4,4-methylene dianiline-salt mixtures to form complexes thereof. 3,899,438, Cl. 252-182.000.
Kaminski, David C. Condition sensing and control apparatus. 3,899,716, Cl. 317-5.000.
Kaneko, Tamaki, to Kabushiki Kaisha Ricoh. Master switch to actuate dampener in automatic duplicator. 3,898,928, Cl. 101-132.500.
Kanzler, Hans-Joachim; and Reuchlein, Gunter, to Maschinenfabrik Augsburg-Nurnburg Aktiengesellschaft; and Motoren-Werke Mannheim AG vorm. Benz Abt. stat. Motorenbau. External combustion hot gas piston engine. 3,898,841, Cl. 60-525.000.
Kao Soap Co., Ltd.: *See*—
Miya, Bunji; Kasutani, Katsuji; Matsuda, Morio; Hashimoto, Akio; Nisigawa, Shiyozo; and Sawamoto, Youzi, 3,899,446.
Karioth, Gernot: *See*—
Trube, Hans; Grimm, Hermann; and Karioth, Gernot, 3,898,921.
Karube, Yukuo, to Canon Kabushiki Kaisha. Mechanism for maintaining a counter at its reset position. 3,899,660, Cl. 235-103.000.
Karwat, Heinz: *See*—
Kruis, August; and Karwat, Heinz, 3,899,312.
Kasparas, Romas: *See*—
Werle, Donald K.; Kasparas, Romas; and Katz, Sidney, 3,899,144.
Kasutani, Katsuji: *See*—
Miya, Bunji; Kasutani, Katsuji; Matsuda, Morio; Hashimoto, Akio; Nisigawa, Shiyozo; and Sawamoto, Youzi, 3,899,446.
Katano, Hamako: *See*—
Oda, Osamu; Sakai, Kiyoshi; Yusa, Takashi; and Katano, Hamako, 3,899,525.
Kato, Yutaka: *See*—
Ikuno, Yuji; and Kato, Yutaka, 3,898,991.
Katsuda, Itsurou, to Jintan Terumo Co., Ltd. Capillary tube for blood examination. 3,898,982, Cl. 128-2.00F.
Katz, Sidney: *See*—
Werle, Donald K.; Kasparas, Romas; and Katz, Sidney, 3,899,144.
Katzen, Elliott D.: *See*—
Burns, Raymond K.; Shure, Lloyd I.; and Katzen, Elliott D., 3,899,680.
Kawaguchi, Yoichi: *See*—
Okamoto, Tsuyoshi; Kawaguchi, Yoichi; and Kai, Takayuki, 3,899,614.
Kawata, Masayuki: *See*—
Tadokoro, Tomoo; and Kawata, Masayuki, 3,898,802.
Kearsey, John Antony. Amphibious vehicles. 3,898,949, Cl. 115-1.00R.
Keating, John H.; and Chase, Alfred E., Jr., to I-T-E Imperial Corporation. Plastic filler with integral bias means. 3,899,101, Cl. 220-241.000.
Keck, Elmer L. Archery bowstring release. 3,898,974, Cl. 124-35.00A.
Keefe, James V.: *See*—
Benz, Ernest A.; and Keefe, James V., 3,898,770.
Keilin, Bertram; and Hebert, Joseph M. Salt recovery system. 3,899,421, Cl. 210-96.000.
Kelley, Wilson E., Jr.; and Wright, Robert, to American Air Filter Company, Inc. Control arrangement for a damper. 3,898,997, Cl. 137-624.180.
Kelly, William F. Apparatus for manufacturing a tendon. 3,899,384, Cl. 156-433.000.
Kelseaux, Ray M.; Dobbs, Harold J.; and Priehe, Frank D., to Cities Service Oil Company. Electronic supervisory monitoring method for drilling wells. 3,898,880, Cl. 73-151.500.
Kemanord AB: *See*—
Johansson, Bernt Eric, 3,899,473.
Kemp, Wayne T., to Raytheon Company. Heating appliance with protective guard. 3,898,975, Cl. 126-42.000.
Kendall, Louis F., Jr.: *See*—
Bredt, James H.; and Kendall, Louis F., Jr., 3,899,360.
Kerr, Maximilian, to Maximilian Kerr Associates, Inc. Photographic positioning and aligning grid. 3,899,791, Cl. 354-155.000.
Kerschbaumer, Hans Gerhard; and Endress, James W., to Carrier Corporation. Economizer pressure regulating system. 3,898,862, Cl. 62-197.000.
Kerschner, James J., to Acme Highway Products Corporation. Sealing member. 3,899,260, Cl. 404-64.000.
Kerst, Al F., to Monsanto Company. Substituted ethane diphosphonic acids and salts and esters thereof. 3,899,528, Cl. 260-488.00J.
Kerstetter, Donald R.: *See*—
Decker, John J.; and Kerstetter, Donald R., 3,898,721.

Kessler, Milton; and Kessler, Ronald N. Method of making plastic-coated wire objects such as intrauterine contraceptive devices. 3,899,564, Cl. 264-255.000.

Kessler, Ronald N.: *See—*
Kessler, Milton; and Kessler, Ronald N., 3,899,564.

Keyes, Richard M.; and Nelson, Bertel S., to Beatrice Foods Co. Single-stage proportioning pump. 3,898,866, Cl. 62-306.000.

Kida, Kiyonori: *See—*
Ogawa, Takashi; Sugiyama, Shunichi; and Kida, Kiyonori, 3,899,701.

Kiencke, Uwe: *See—*
Honig, Gunther; and Kiencke, Uwe, 3,898,962.

Kieras, Joseph A.: *See—*
Rosenthal, Rudolph; and Kieras, Joseph A., 3,899,576.

Kimura, Hiroshi; Kusakabe, Kensuke; Tokuda, Katsuhiko; Miyawaki, Masaru; and Nakatani, Hiromi, to Takeda Chemical Industries, Ltd. Shaped polysaccharide articles and a method for producing them. 3,899,480, Cl. 260-209.00R.

King, Henry L.: *See—*
McGee, John W.; and King, Henry L., 3,899,470.

King, Hoyd S., Jr.: *See—*
Codding, Elias H.; and King, Hoyd S., Jr., 3,899,415.

King Radio Corporation: *See—*
Lehfeldt, James J., 3,899,661.

Kinnison, Robert W. Permanent magnet motion conversion means. 3,899,703, Cl. 310-103.000.

Kinnunen, Roy W. Snow plow apparatus. 3,898,753, Cl. 37-46.000.

Kirby, James S.; and Accornero, Louis, to Aurora Products Corporation. Model vehicle racetrack tool. 3,898,723, Cl. 29-200.00H.

Kishi, Tuneo; and Nakano, Seizo, to Hitachi, Ltd. Grounded tank circuit breaker. 3,899,650, Cl. 200-148.00A.

Kitagami, Hisashi: *See—*
Shigemori, Hideto; Ueba, Akio; and Kitagami, Hisashi, 3,899,103.

Kitamoto, Tatsuji: *See—*
Shirahata, Ryuji; Kitamoto, Tatsuji; Shimizu, Mahito; and Suzuki, Masaaki, 3,898,952.

Klauke, Erich: *See—*
Scholl, Hans-Joachim; Klauke, Erich; Grewe, Ferdinand; and Hammann, Ingeborg, 3,899,584.

Kleeberg, Gunther K. E., to M. M. Newman Corporation. Soldering iron tip and method of fabrication. 3,899,114, Cl. 228-55.000.

Klein, Gerald B. Hook connector. 3,898,760, Cl. 43-44.830.

Klein, Klaus-Wilhelm; and Rau, Peter, to Siemens Aktiengesellschaft. Measuring apparatus for the coolant outlet temperature in nuclear-reactor fuel elements. 3,899,390, Cl. 176-19.00R.

Kleinschmidt, Peter, to Siemens Aktiengesellschaft. Piezoelectric key. 3,899,698, Cl. 310-9.500.

Klimpl, Fred, to Fiberglass Resources Corporation. Modular duct system for elongated flexible members such as telephone cable or the like. 3,899,005, Cl. 138-106.000.

Klippan GmbH Hamburg: *See—*
Balder, Arnold, 3,898,715.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Jakobs, Willy, 3,899,281.

Knoop, Donald E.; Loessel, Marc C.; and Nystuen, Arne M., to Whirlpool Corporation. Method and apparatus for testing electric motors. 3,898,875, Cl. 73-116.000.

Knopp, Walter V.; and Cascone, Paul J., to A. Johnson & Co. Inc. Exothermic brazing of aluminum. 3,899,306, Cl. 29-197.000.

Knorr-Bremse GmbH: *See—*
Nadas, Gyula, 3,899,053.

Kobayashi, Hisamine, to Shikishima Tipton Mfg. Co., Ltd. Automatic recipro-finishing machine. 3,898,767, Cl. 51-7.000.

Kobayashi, Isamu: *See—*
Wakamiya, Kinji; and Kobayashi, Isamu, 3,899,793.

Kobrehel, Peter M., to General Motors Corporation. Vehicle seat attachment device. 3,899,151, Cl. 248-429.000.

Kobylinski, Lech: *See—*
Zadrozny, Jan; Kobylinski, Lech; and Jaworski, Stefan, 3,898,946.

Koch, Walter T.; and Wielicki, Edward A., to FMC Corporation. Cellulosic film having increased stiffness. 3,899,452, Cl. 260-2.50B.

Kochemidov, Atanas Dimitrov: *See—*
Makedonski, Boris Georgiev; Kochemidov, Atanas Dimitrov; Dumanov, Ivan Minkov; and Payakov, Stefan Georgiev, 3,898,769.

Koehring Company: *See—*
Briggs, Eugene C.; and Reichel, Lee E., 3,899,263.

Koenig, Peter J., to Concast AG. Method of casting steel into a continuous casting mold and pouring tube for the performance of the aforesaid method. 3,899,018, Cl. 164-82.000.

Kohner, Gabriel, to Amiad, Mutzarei Yiul-1972. Sheet storage and dispensing container. 3,899,104, Cl. 221-197.000.

Kokusai Cable Ship Co., Ltd.: *See—*
Ezoe, Takuji; and Shirai, Kikuo, 3,898,852.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Watanabe, Teruji; and Ishihara, Hideo, 3,899,781.

Kolenik, Steve A.; and Johnson, William L., to Arco Nuclear Company. Fixed-rate pacer circuit with self-starting capability. 3,898,994, Cl. 128-419.0PG.

Komedera, Mieczyslaw, to MK Refrigeration Ltd. Water chilling method and apparatus. 3,898,856, Cl. 62-98.000.

Kominami, Yasuo, to Hitachi, Ltd. Transistor amplifier circuit. 3,899,744, Cl. 330-30.00D.

Komiyama, Shigeo; Matsubara, Ichiro; and Shiraishi, Masatake, to Hitachi, Ltd. Method for controlling vacuum pan. 3,899,386, Cl. 159-47.00R.

Kondo, Kyozo; and Okimoto, Takeyoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Handrails for conveyors. 3,899,067, Cl. 198-16.0MS.

Koninklijke Emballage Industrie Van Leer B.V.: *See—*
Evans, Albert Edward John; Aincough, Anthony Norbert; and Verschoore, Koen, 3,899,364.

Koppers Company, Inc.: *See—*
Calistrat, Michael M., 3,898,813.

Kordesch, Karl V., to Union Carbide Corporation. Gas electrodes and a process for producing them. 3,899,354, Cl. 136-86.00D.

Kornfeld, Edmund C.: *See—*
Suarez, Tulio; Kornfeld, Edmund C.; and Sheneman, Jack M., 3,899,592.

Korte, Alfred C., to ACF Industries, Incorporated. Apparatus for controlling and modulating engine functions. 3,899,551, Cl. 261-39.00A.

Kostiainen, Lauri: *See—*
Reijonen, Olavi; and Kostiainen, Lauri, 3,899,086.

Kozak, Zdenek: *See—*
Kozak, Zdenek Vaclav; and Stupecky, Joseph Jaromir, 3,898,883.

Kozak, Zdenek Vaclav; and Stupecky, Joseph Jaromir, to Kozak, Zdenek. Stator assembly for flowmeters and the like. 3,898,883, Cl. 73-231.00R.

Kraft, Eckhard: *See—*
Pollert, Wolfgang; Kraft, Eckhard; and Pennig, Gregor, 3,898,799.

Kraft, Karl-Josef: *See—*
Wagner, Kuno; Dietrich, Werner; Kraft, Karl-Josef; and Conrad, Horst, 3,899,454.

Krainer, Erich, to U.S. Philips Corporation. Dry shaver. 3,898,732, Cl. 30-43.920.

Kramer, Kurt H. High energy forging press. 3,898,834, Cl. 72-453.000.

Kreeger, Richard C.; and Kuitunen, Matthew O., to Sperry Rand Corporation. Method and means for reducing data transmission rate in synthetically generated motion display systems. 3,899,662, Cl. 235-151.000.

Krieger, Wilhelm: *See—*
Unterstenhoefer, Leo; and Krieger, Wilhelm, 3,899,455.

Krivobokov, Vladimir Nikolaevich: *See—*
Borisenko, Gleb Pavlovich; Chernobrivenko, Jury Sergeevich; Kutsov, Jury Georgievich; Gorbanev, Arkady Alexeevich; Kukushkin, Oleg Nikolaevich; Krivobokov, Vladimir Nikolaevich; Pobegailo, Grigory Gavrilovich; and Nashivanko, Vitaly Dmitrievich, 3,898,830.

Krueger, Hans: *See—*
Greubel, Waldemar; Krueger, Hans; and Wolff, Ulrich, 3,899,786.

Krug, William H., to Warner Electric Brake & Clutch Company. Excitation control for normally engaged, electrically released magnetic coupling. 3,899,061, Cl. 192-84.0PM.

Kruger, Leo: *See—*
Rutenberg, Morton W.; Tessler, Martin M.; and Kruger, Leo, 3,899,602.

Kruger, Wolfgang: *See—*
Dannert, Dietmar; Ihlenburg, Rainer; Nackmayr, Dietrich; Goetze, Rudolf; Kruger, Wolfgang; Peter, Hartmut; Westphal, Klaus; and Thuy, Hans-Joachim, 3,899,181.

Kruis, August; and Karwat, Heinz, to Linde Aktiengesellschaft Zentrale Patentabteilung. Extraction of odorizing sulfur compounds from natural gas and reodorization therewith. 3,899,312, Cl. 62-17.000.

Krupick, Walter J.: *See—*
Hanna, Samuel C.; and Krupick, Walter J., 3,899,702.

Kruse, Henry E. Safety tire tread insert. 3,899,013, Cl. 152-208.000.

Krutchen, Charles M.: *See—*
Sliva, Daniel E.; Krutchen, Charles M.; and Shade, Ray W., 3,899,574.

Kubo, Masayoshi: *See—*
Okazaki, Kaoru; Yagi, Kenkichi; Okamoto, Miyoshi; Watanabe, Koji; Hikota, Toyohiko; and Kubo, Masayoshi, 3,899,292.

Kuboko Paint Co., Ltd.: *See—*
Takahashi, Toshiro; Nagano, Toshihiro; Aoshima, Yasuo; Suzuki, Matsuo; Suzuki, Shozo; and Asahina, Teruo, 3,899,370.

Kubota, Hidenobu: *See—*
Syoji, Masaaki; Ishihara, Goro; Hirose, Masao; Kubota, Hidenobu; and Mitani, Naoyuki, 3,899,530.

Kuitunen, Matthew O.: *See—*
Kreeger, Richard C.; and Kuitunen, Matthew O., 3,899,662.

Kukushkin, Oleg Nikolaevich: *See—*
Borisenko, Gleb Pavlovich; Chernobrivenko, Jury Sergeevich; Kutsov, Jury Georgievich; Gorbanev, Arkady Alexeevich; Kukushkin, Oleg Nikolaevich; Krivobokov, Vladimir Nikolaevich; Pobegailo, Grigory Gavrilovich; and Nashivanko, Vitaly Dmitrievich, 3,898,830.

Kuniholm, Martin L., to Cincinnati Milacron-Heald Corporation. Grinding machine. 3,898,771, Cl. 51-165.900.

Kureha Kogaku Kogyo Kabushiki Kaisha: *See—*
Amagi, Yasuo; and Yusa, Haruhiko, 3,899,547.

Kurumada, Tomoyuki: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 3,899,464.

Kusakabe, Kensuke: *See—*
Kimura, Hiroshi; Kusakabe, Kensuke; Tokuda, Katsuhiko; Miyawaki, Masaru; and Nakatani, Hiromi, 3,899,480.

Kusters, Eduard: *See—*
Kutz, Johannes, 3,898,821.

Kustom Electronics, Inc.: *See—*
Mead, Alan B.; Aker, John L.; Malan, David A.; and Alden, John R., 3,899,772.

Kutsov, Jury Georgievich: *See—*
Borisenko, Gleb Pavlovich; Chernobrivenko, Jury Sergeevich; Kutsov, Jury Georgievich; Gorbanev, Arkady Alexeevich; Kukushkin, Oleg Nikolaevich; Krivobokov, Vladimir Nikolaevich; Pobegailo, Grigory Gavrilovich; and Nashivanko, Vitaly Dmitrievich, 3,898,830.

Kutz, Johannes, to Kusters, Eduard. Treatment chamber for a continuously moving web. 3,898,821, Cl. 68-5.00E.

Kuzmar, Edward; and Kuzmar, Mary. Mechanical alarm sounding failure of electrical system. 3,899,783, Cl. 340-253.00C.

Kuzmar, Mary: *See—*
Kuzmar, Edward; and Kuzmar, Mary, 3,899,783.

Laberis, George A.: *See—*
Binding, Kenneth W.; and Laberis, George A., 3,899,110.
Binding, Kenneth W.; and Laberis, George A., 3,899,111.

Lack, Bryan E. C.; and Newman, Alec T., to General Foods Corporation. Cup dispenser with reciprocating actuator. 3,899,102, Cl. 221-6.000.

Ladany, Ivan; and Cannuli, Vincent Michael, to RCA Corporation. Method of forming PN junctions by liquid phase epitaxy. 3,899,371, Cl. 148-171.000.

Laessig, Rudolf R., to General Electric Company. Vapor generator. 3,899,031, Cl. 122-250.00R.

Lafferty, Edwin C.: *See—*
Giles, Olin S.; and Lafferty, Edwin C., 3,899,747.

Lake, John K., to Graff, John P., Jr., a part interest. Disposable aquarium filter. 3,899,424, Cl. 210-169.000.

Lamantia, John: *See—*
Aber, Henry S.; Riggs, Dean D.; and Lamantia, John, 3,899,410.

Lamb, Leo M.: *See—*
Hall, Joseph J.; and Lamb, Leo M., 3,899,075.

Lambert, Robert L., Jr.: *See—*
Seyferth, Dietmar; and Lambert, Robert L., Jr., 3,899,523.

Lancon, Bernard: *See—*
Mercier, Jacques; and Lancon, Bernard, 3,898,934.

Land, Edwin H., to Polaroid Corporation. Processing composition for diffusion transfer color process containing polyethylene glycol. 3,899,336, Cl. 96-66.00R.

Lanet, Jean-Claude, to Rhone-Progil. Method for the simultaneous production of organic acid chlorides and chlorinated unsaturated hydrocarbons. 3,899,532, Cl. 260-544.00M.

Lang, David, to Harsco Corporation. Method and apparatus to perforate pipe. 3,899,265, Cl. 408-50.000.

Lang, John M., to Boeing Company, The. Traction-demand power drive unit. 3,899,070, Cl. 198-127.00R.

Lang, William H.: *See—*
Chang, Clarence D.; and Lang, William H., 3,899,544.

Langeluddeke, Peter: *See—*
Horlein, Gerhard; Langeluddeke, Peter; Schonowsky, Hubert; and Studeneer, Adolf, 3,899,489.

Langne, Bengt I., to Acme-Cleveland Corporation. Three-position molding machine. 3,899,019, Cl. 164-201.000.

Lanigan, John J.; Glickman, Myron; and Hehn, Anthony H., to Mi-Jack Products, Inc. Container retrieval system. 3,899,205, Cl. 294-81.00R.

Larchar, Trescott B.: *See—*
Sieckhaus, John F.; Scott, Robert N.; and Larchar, Trescott B., 3,899,456.

Larsen, John M., to MSI Data Corporation. Automatic store transaction system and terminal therefor. 3,899,775, Cl. 340-172.500.

La Russa, Joseph. Implantable heart valve. 3,898,701, Cl. 3-1.500.

Laubman, Kenneth C.: *See—*
Cleveley, John B.; and Laubman, Kenneth C., 3,899,639.

Lauterbach, William L., to United States Steel Corporation. Adjustable stop block for timing spindle. 3,899,274, Cl. 425-237.000.

Lawrence, Manuel P.; and Jacobson, Kenneth F. Miner's pan. 3,899,418, Cl. 209-447.000.

Le Nickel: *See—*
Pocachard, Alain, 3,899,790.

Leaky, Joseph W.: *See—*
Stollberg, Ray H.; and Leaky, Joseph W., 3,899,123.

Le Blanc, Robert Bruce, to Cotton Incorporated. Production of textile materials with improved flame retardance. 3,899,483, Cl. 260-231.00A.

Leco Corporation: *See—*
Sitek, George J.; and Berk, Charles W., 3,899,627.

Lederle, George M.: *See—*
Craig, David R.; Lederle, George M.; and Plante, Franklin T., 3,899,369.

Lederman, Steven N.: *See—*
Samhammer, Clair A.; and Lederman, Steven N., 3,899,210.

Lederman's Incorporated: *See—*
Samhammer, Clair A.; and Lederman, Steven N., 3,899,210.

Lee, Douglas J. Flying toy projectile. 3,898,765, Cl. 46-81.000.

Lee, Hanju: *See—*
Chi, Donald G.; and Lee, Hanju, 3,899,310.

Lee, Meyer & Associates, Inc.: *See—*
McGrath, Thomas F., 3,899,423.

Lefebvre, Jacques: *See—*
Patrie, Jos; Lefebvre, Jacques; and Allegret, Francois, 3,899,400.

Lefevre, Robert P. Multiple pulse capacitor discharge ignition circuit. 3,898,971, Cl. 123-148.0CB.

Legatti, Raymond H.; Clinton, Charles M.; and Draper, Charles W., to Electromagnetic Industries, Inc. Ground fault detectors. 3,899,717, Cl. 317-18.00D.

LeGrow, Gary E.: *See—*
Speier, John L.; and LeGrow, Gary E., 3,899,515.

Lehfeldt, James J., to King Radio Corporation. Method and apparatus for altitude capture control for aircraft guidance systems. 3,899,661, Cl. 235-150.200.

Leichliter, Wayne K., to Eaton Corporation. Fluid coupling assembly. 3,899,059, Cl. 192-57.000.

Leister, Heinrich: *See—*
Wessling, Diether; Leister, Heinrich; and Degener, Eberhart, 3,899,504.

Leistner, Werner, to Siemens Aktiengesellschaft. Starter or damper winding arrangement for a synchronous electrical machine. 3,899,704, Cl. 310-183.000.

Leitz, Ludwig: *See—*
Frenk, Helmuth; and Leitz, Ludwig, 3,899,251.

Le Maout, Theophile Francois: *See—*
Camboulives, Andre Alphonse Mederic Leon; Le Maout, Theophile Francois; and Zibette, Bernard Arthur, 3,899,133.

LeMere, Roger: *See—*
Crawford, Douglas J.; LeMere, Roger; and Hughes, Francis H., 3,898,941.

Lemmond, Charles Q., to General Electric Company. Laminated multi-apertured electrode. 3,899,711, Cl. 313-458.000.

Le Page, Jean-Francois: *See—*
Cosyns, Jean; Franck, Jean-Pierre; and Le Page, Jean-Francois, 3,899,543.

Levi-Setti, Riccardo, to University of Chicago, The. Solar energy collection. 3,899,672, Cl. 350-293.000.

Levin, Harry A.: *See—*
Grossman, Leonard N.; and Levin, Harry A., 3,899,392.

Lewbill Industries Inc.: *See—*
Coffman, William H., Jr., 3,898,976.

Lewis, David E.: *See—*
Sorenson, Keith S.; and Lewis, David E., 3,899,633.

Lewis, Hector E., deceased; and by MacLean, June Rae, executrix, to Surgical Appliance Industries, Inc. Hinge for knee brace. 3,898,709, Cl. 16-145.000.

Lewis, James M., to Horizons Incorporated. Photosensitive material suitable for use as a photoresist. 3,899,338, Cl. 96-115.00P.

Lewis, John William; and Readhead, Michael John, to Reckitt & Colman Products Limited. Cycloalkylamino compounds. 3,899,510, Cl. 260-326.50M.

Lewis, Kenneth, to H.S.M. Americas Ltd. Modular filter and automatic chlorinator for swimming pools. 3,899,425, Cl. 210-206.000.

Lewis, Merle J.: *See—*
Insley, Gene L.; and Lewis, Merle J., 3,898,792.

Lewis, Richard L.: *See—*
Ewald, Jerome T.; and Lewis, Richard L., 3,898,808.
Hendrickson, Richard T.; Lewis, Richard L.; Ewald, Jerome T.; Bach, Lloyd G.; and Hickner, George B., 3,898,913.

Li, Jorge P.: *See—*
Shen, Tsung-Ying; Dorn, Conrad P., Jr.; and Li, Jorge P., 3,899,506.

Liautaud, James P.: *See—*
Hilgers, Raymond H.; and Liautaud, James P., 3,899,305.

Lightolier Incorporated: *See—*
Donato, Anthony C., 3,898,782.

Lily Mills Company: *See—*
Carter, Joseph V., II, 3,898,725.

Lim, John C., to Engelhard Minerals & Chemicals Corporation. Brightness of crystalline layered silicate minerals. 3,899,343, Cl. 106-72.000.

Limberg, Allen Leroy: *See—*
Steckler, Steven Alan; and Limberg, Allen Leroy, 3,899,635.

Limburg, William W., to Xerox Corporation. Active matrix and intrinsic photoconductive polymer of a linear polysiloxane. 3,899,328, Cl. 96-1.500.

Linares, Robert C., to Allied Chemical Corporation. Process of growing crystals. 3,899,304, Cl. 23-301.0SP.

Lindahl, Robert E.; and French, Charlie N., to Masco Corporation of Indiana. Clutch having rotatable power transmitting parts which shift relative to each other at variable torque loads. 3,898,816, Cl. 64-29.000.

Linde Aktiengesellschaft Zentrale Patentabteilung: *See—*
Kruis, August; and Karwat, Heinz, 3,899,312.

Linder, John E. Dental instrument. 3,898,738, Cl. 32-41.000.

Lindskog, Per Folke; Arbstedt, Per Gunnar; and Wastenson, Erik Goran, to Hoganas AB, Fack. Powder mixture for the production of alloy steel with a low content of oxide inclusions. 3,899,319, Cl. 75-.5BA.

Linehan, John J.: *See—*
Wallace, Gary Leonard; Linehan, John J.; and Marshall, Robert Howard, 3,899,068.

Linnenbecker, Udo: *See—*
Renner, Eckhart; and Linnenbecker, Udo, 3,898,916.

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Billberg, Alfred, 3,898,998.

List, Hans. Cylinder-head of an internal combustion engine with two intake valves for each cylinder. 3,898,966, Cl. 123-75.00B.

Lith-Kem Corporation: *See—*
Traskos, Richard T., 3,899,332.

Litton Business Systems, Inc.: *See—*
Brignole, Frederick A., 3,899,065.

Ljungberg, Per Allan: *See—*
Stark, Sven Olof Soren; and Ljungberg, Per Allan, 3,899,112.

Lloyd, Neil E., to Celanese Corporation. Methods and apparatus for interlacing yarn. 3,898,719, Cl. 28-1.400.

Lockheed Aircraft Corporation: *See—*
Winter, Gordon; and Adcock, J. O., 3,898,835.

Lockwood, John C.; and Vaughan, Harry L., to Scripto, Inc. Cigarette lighter having orientation sensitive valve actuation means. 3,899,286, Cl. 431-321.000.

Loe, James M., to Pressman, D. R. Indicating target employing foil sheet. 3,899,175, Cl. 273-102.10C.

Loeffler, Otto Ernest, to NL Industries, Inc. Trivalent antimony catalyst. 3,899,522, Cl. 260-414.000.

Loessel, Marc C.: *See—*
Knoop, Donald E.; Loessel, Marc C.; and Nystuen, Arne M., 3,898,875.

Lombardi, Jack P. Non-rotating two-part mandrel and a method of forming spiral-seamed pipe. 3,898,826, Cl. 72-49.000.

Long, Raymond H.; and Unger, Harold, to Lummus Company, The. Recovery of high purity vinyl chloride by distillation. 3,899,399, Cl. 203-77.000.

Longfellow, Richard C.: *See—*
Bailey, John M.; and Longfellow, Richard C., 3,899,280.

Lonneker, Neal A.; Miller, Herman H., Jr.; and Pigott, George M. Process for chemically bonding animal protein to peeled kernels of cereal grains. 3,899,609, Cl. 426-287.000.

Loomis Products Company: *See—*
Kahlefeld, Karl W., 3,898,831.

Lord, Peter C.: *See—*
Farrington, Gregory C.; Will, Fritz G.; and Lord, Peter C., 3,899,352.

Lorenz, Donald H.; and Williams, Earl P., to GAF Corporation. Dialkylaminoethyl vinyl ether interpolymers. 3,899,471, Cl. 260-80.730.

Lowther, Frank E., to Purification Sciences Inc. Dielectric liquid-immersed corona generator. 3,899,683, Cl. 250-532.000.

Lowther, Frank Eugene, to Purification Sciences Inc. Corona reactor method and apparatus. 3,899,682, Cl. 250-532.000.

Luc, Penelope Jane Vesey. Bonding aluminium. 3,899,377, Cl. 156-73.500.

Lucaire, Pierre: *See—*
Castera, Andre; and Lucaire, Pierre, 3,898,933.

Lucas Electrical Company Limited, The: *See—*
Sutton, Christopher John, 3,899,215.

Lucas-Milhaupt, Inc.: *See—*
Lucas, William F., 3,899,074.

Lucas, William F., to Lucas-Milhaupt, Inc. Brazing washer chain. 3,899,074, Cl. 206-343.000.

Ludeman, Russell S. Device for resiliently locking aircraft controls. 3,898,823, Cl. 70-200.000.

Luftkonditionering AB: *See—*
Persson, Sixten Ismael, 3,899,022.

Luhr Jensen & Sons, Inc.: *See—*
Jensen, Philip W., 3,898,759.

Lummus Company, The: *See—*
Long, Raymond H.; and Unger, Harold, 3,899,399.
Tsao, Utah, 3,899,545.

Lundahl, Ezra Cordell, to Ezra C. Lundahl, Inc. Air delivery foliage wagon. 3,898,786, Cl. 56-344.000.

Luongo, Michael C., to Westinghouse Electric Corporation. Electric power plant system and method for operating a steam turbine especially of the nuclear type with electronic reheat control of a cycle steam reheater. 3,898,842, Cl. 60-653.000.

Luska, Zdenek, to J. Bobst & Fils S.A. Apparatus and method for controlling registration. 3,899,686, Cl. 250-555.000.

Luzzi, John J.: *See—*
Ramey, Chester E.; and Luzzi, John J., 3,899,491.

Lynes, Inc.: *See—*
Clark, Billy E., 3,899,631.

M. L. Aviation Company Limited: *See—*
Craigie, Samuel W., 3,898,909.

M. M. Newman Corporation: *See—*
Kleeberg, Gunther K. E., 3,899,114.

Maark Corporation: *See—*
Vaughn, George A.; and Hargrave, Richard D., 3,899,172.

Maass, Hans: *See—*
Eckold, Gerd-Jurgen; and Maass, Hans, 3,898,832.

Macco Oil Tool Company, Inc.: *See—*
Dinning, Robert W., 3,899,025.

Machida, Hiromasa; and Yamaguchi, Noboru, to Sony Corporation. Color cathode ray tube with temperature-responsive color purity magnets. 3,899,710, Cl. 313-412.000.

MacLean, June Rae, executrix: *See—*
Lewis, Hector E., deceased; and MacLean, June Rae, executrix, 3,898,709.

MacMillan Bloedel Research Limited: *See—*
Johnanson, Fred E.; and Watkins, William L., 3,899,559.

Maeda, Teruo; Shimoe, Hideo; Fujiwara, Yasuhiko; Aya, Norimoto; Marumo, Nagayuki; Tsuji, Heigo; and Sakamoto, Yuzo, to Nissan Motor Company Limited. Impact absorbing device and motor vehicle body structure incorporating the same. 3,899,047, Cl. 188-1.00C.

Magee, Philip S., to Chevron Research Company. Herbicidal 1,5-dithia-2,4,6,8-tetrazacyclooctane-3,7-dione. 3,899,318, Cl. 71-90.000.

Mager, Charles J. Electric vehicle. 3,899,041, Cl. 180-65.00R.

Magiros, Peter G., to Olin Corporation. Method for automatic feed forward control of effluent pH. 3,899,294, Cl. 23-230.00A.

Magnanini, Umberto, to Tecnomare S.p.A. Fixed platform for deep sea depths able to house plants, equipments structures, men and means. 3,898,847, Cl. 61-46.500.

Mahlman, Bert H., to Hercules Incorporated. Method of preparing aqueous dispersions of hydroxypropyl cellulose. 3,899,439, Cl. 252-311.000.

Maier, Gerhard; and Fischer, Bertram, to GTE International. Variable inductive resonant circuit arrangement having a diamagnetic core for the UHF range. 3,899,758, Cl. 333-70.00S.

Mailen, James C.; and Johnson, Wayne F., to United States of America, Energy Research and Development Administration. Whole blood analysis rotor for a multistation dynamic photometer. 3,899,296, Cl. 23-259.000.

Makedonski, Boris Georgiev; Kochemidov, Atanas Dimitrov; Dumanov, Ivan Minkov; and Payakov, Stefan Georgiev, to Zniitmash. Method and apparatus for centreless magnetic abrasive polishing. 3,898,769, Cl. 51-88.000.

Malan, David A.: *See—*
Mead, Alan B.; Aker, John L.; Malan, David A.; and Alden, John R., 3,899,772.

Malaviya, Shashi D., to International Business Machines Corporation. Controlled high frequency transistor crystal oscillator. 3,899,753, Cl. 331-109.000.

Malcik, Frank J.: *See—*
Young, Raymond R.; and Malcik, Frank J., 3,899,082.

Malmendier, Joseph W., to Corning Glass Works. High elastic modulus glass-ceramic articles. 3,899,340, Cl. 106-39.600.

Malobicky, Rudolph L., Jr.; Perkins, James B.; and Taylor, Robert H., to PPG Industries, Inc. Visual display windshield. 3,899,241, Cl. 350-174.000.

Malozemoff, Alexis Plato, to International Business Machines Corporation. Magnetic bubble domain system using different types of domains. 3,899,779, Cl. 340-174.0TF.

Malpass, Alexander, Sr. Fuel injector assembly. 3,898,970, Cl. 123-139.0AJ.

Mandel, Louis; Ong, Algernon M.; and Singer, Paul, to United States of America, Navy. Ambulatory patient monitoring system. 3,898,984, Cl. 128-2.10A.

Manufacture de Machines du Haut-Rhin S.A.: *See—*
Castera, Andre; and Lucaire, Pierre, 3,898,933.

Marathon Oil Company: *See—*
Hayes, John B.; Haws, Gerald W.; and Gogarty, William B., 3,899,431.

Marcatili, Enrique Alfredo Jose: *See—*
Arnaud, Jacques Alexis; and Marcatili, Enrique Alfredo Jose, 3,899,235.

Marco, Leslie Stephan, to Illinois Tool Works Inc. Reformed plastic article and method of manufacture. 3,899,096, Cl. 215-31.000.

Marconi Company Limited, The: *See—*
Bodonyi, Janos, 3,899,756.

Marcus, Douglas Larry, to Schwartz, Joseph M., a part interest. Breathing gas heater. 3,898,978, Cl. 126-204.000.

Maremont Corporation: *See—*
Terry, Stanley M., deceased; and Third National Bank of Hampden County, executor, the, 3,899,652.

Markus, Isidoro N. Thermo insulated hydraulic restrictors. 3,898,968, Cl. 123-122.00E.

Maroschak, Ernest J. Coupling for interconnecting corrugated plastic tubes. 3,899,198, Cl. 285-27.000.

Marsh-McBirney, Inc.: *See—*
Darby, James J., Jr., 3,898,881.

Marshall, Albert H., to United States of America, Navy. Laser system for weapon fire simulation. 3,898,747, Cl. 35-25.000.

Marshall, Robert Howard: *See—*
Wallace, Gary Leonard; Linehan, John J.; and Marshall, Robert Howard, 3,899,068.

Marsilio, Joseph V.: *See—*
Oliver, Evan M.; and Marsilio, Joseph V., 3,899,321.

Martin, Arthur E. Rowing apparatus. 3,898,950, Cl. 115-24.100.

Martin, Ernest Newell, to Arrowhead Puritas Waters, Inc. Timed coin control device. 3,899,064, Cl. 194-9.00T.

Martin, Hans. Ski brake mechanism. 3,899,185, Cl. 280-11.13B.

Martin Marietta Corporation: *See—*
Williams, Laurence O., 3,898,798.

Martin, Thomas C. Combination brake and vehicle assembly. 3,899,049, Cl. 188-18.00A.

Martino, Germain: *See—*
Goldenberg, Emmanuel; Dawans, Francois; Durand, Jean-Pierre; and Martino, Germain, 3,899,474.

Marumo, Nagayuki: *See—*
Maeda, Teruo; Shimoe, Hideo; Fujiwara, Yasuhiko; Aya, Norimoto; Marumo, Nagayuki; Tsuji, Heigo; and Sakamoto, Yuzo, 3,899,047.

Maryland Cup Corporation: *See—*
Hollinger, Paul, 3,899,118.
Weinstein, David, 3,898,899.

Masai, Tadahisa; Adachi, Tetsuro; Sasaki, Shigeru; and Moriyama, Kazuyoshi, to Hitachi, Ltd. Vortex blower. 3,899,266, Cl. 415-213.00T.

Maschinenfabrik Augsburg-Nurnburg Aktiengesellschaft: *See—*
Kanzler, Hans-Joachim; and Reuchlein, Gunter, 3,898,841.

Masclet, Jean; and Turiot, Andre, to Messier-Hispano. Trailing-wheel undercarriage train. 3,899,147, Cl. 244-102.00R.

Masco Corporation of Indiana: *See—*
Lindahl, Robert E.; and French, Charlie N., 3,898,816.

Massachusetts Institute of Technology: *See—*
Baker, Richard H., 3,899,689.
Seyferth, Dietmar; and Lambert, Robert L., Jr., 3,899,523.

Masubuchi, Yoshinori: *See—*
Okazaki, Kaoru; Yagi, Kenkichi; Ichimura, Akira; and Masubuchi, Yoshinori, 3,899,623.

Masumura, Masao, to Ricoh Co., Ltd. Developing unit for electrostatic latent image. 3,898,957, Cl. 118-637.000.

Material Distributors Corporation: *See—*
Willdorf, Michael E., 3,899,621.

Mather, Douglas Edward: *See—*
Messenger, Edward Tunstall; and Mather, Douglas Edward, 3,899,448.

Matlock, Robert B.; Wilmer, Reginald B.; and Ferguson, Dale L., to National Steel Products Company. Building panel and joint. 3,898,783, Cl. 52-529.000.

Matsubara, Ichiro: *See—*
Komiyama, Shigeo; Matsubara, Ichiro; and Shiraishi, Masatake, 3,899,386.

Matsuda, Hideaki; and Okamoto, Takanori. Anaerobic bonding agent. 3,899,382, Cl. 156-327.000.

Matsuda, Hideki, to Nippon Gakki Seizo Kabushiki Kaisha. Ski having base blocks for securing bindings. 3,899,186, Cl. 280-11.13W.

Matsuda, Morio: *See—*
Miya, Bunji; Kasutani, Katsuji; Matsuda, Morio; Hashimoto, Akio; Nisigawa, Shiyozo; and Sawamoto, Youzi, 3,899,446.

Matsui, Katsuaki: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 3,899,464.

Matsushima, Masatoshi: *See—*
Furuya, Shoji; Takahashi, Masaoki; and Matsushima, Masatoshi, 3,899,088.

Matthews, David G. Corner structure for door frames and the like. 3,899,258, Cl. 403-292.000.

Matthiesen, Uwe: *See—*
Oelschlager, Herbert; Matthiesen, Uwe; and Behrendt, Wilhelm A., 3,899,488.

Maurer, Dean William; and Schull, Leona Louise, to Bell Telephone Laboratories, Incorporated. Formation of electrodes for alkaline batteries. 3,899,351, Cl. 136-34.000.

Mauroy, Philippe: *See—*
Decramer, Lionel; and Mauroy, Philippe, 3,899,674.

Mausezahl, Dieter: *See—*
Buhler, Arthur; Schutz, Hans Ulrich; Mausezahl, Dieter; Harris, Melvin; and Guth, Christian, 3,899,469.

Max-Planck-Gesellschaft ZUR Forderung der Wissenshaften e.V.: *See—*
Hoppe, Walter, 3,899,728.

Maximilian Kerr Associates, Inc.: *See—*
Kerr, Maximilian, 3,899,791.

Mayer, Hans; and Schroder, Heinz-Jurgen, to Siemens Aktiengesellschaft. Steam generator. 3,898,961, Cl. 122-32.000.

McArthur, Billy W., to Sperry-Sun Well Surveying Company. Method and apparatus for measuring pressure related parameters. 3,898,877, Cl. 73-151.000.

McCabe, Francis J. Single blade fire damper. 3,899,156, Cl. 251-303.000.

McCabe, John Stanton, to Chicago Bridge & Iron Company. Offshore storage tank. 3,898,846, Cl. 61-46.000.

McCain Manufacturing Corporation: *See—*
Bulka, Raymond I., 3,898,903.

McCaully, Ronald J., to American Home Products Corporation. Intermediates for the preparation of 1,3-dihydro-2H-1,4-benzodiazepin-2-ones. 3,899,527, Cl. 260-488.0GM.

McCoy, Lowell R.: *See—*
Iverson, Marlowe L.; and McCoy, Lowell R., 3,899,405.

McDonald, Louis, to McDonald, Louis. Detergent compositions containing silica colloids. 3,899,447, Cl. 252-539.000.

McDonnell Douglas Corporation: *See—*
Gallaher, William C.; Stephens, Jerome P.; Testa, Phillip J.; and Wein, James E., 3,898,704.

McElroy, Jerry T., to Automation Industries, Inc. Multi-frequency ultrasonic search unit. 3,898,840, Cl. 73-67.900.

McErlean, Edwin A.: *See—*
Haraway, William H., Jr.; Dale, Walter J.; and McErlean, Edwin A., 3,898,730.

McFadden, James D. Pipe alignment clamp. 3,898,714, Cl. 24-81.0PE.

McGann, John J., Jr. Egg cutting board. 3,899,161, Cl. 269-13.000.

McGarry, Aubrey Richard: *See—*
Rivalland, Louis France; and McGarry, Aubrey Richard, 3,898,706.

McGee, John W.; and King, Henry L., to Monsanto Company. Continuous process for preparation of basic dyeable polyester. 3,899,470, Cl. 260-75.00S.

McGrath, Thomas F., to Lee, Meyer & Associates, Inc. Sewage treatment system. 3,899,423, Cl. 210-152.000.

McHenry, Vincent J., to Omni Spectra, Inc. Glass breakage detector. 3,899,784, Cl. 340-274.00R.

McHugh, John. Bus having a separate wheeled motive power unit. 3,899,039, Cl. 180-11.000.

McKinney Manufacturing Company: *See—*
Gwozdz, Joseph W., 3,898,708.

McLean, Daniel E.: *See—*
Butcher, Julia A.; and McLean, Daniel E., 3,898,985.

McMillin, John R., to Cornelius Company, The. Beverage dispenser. 3,898,861, Cl. 62-177.000.

McSheehy, Richard Y.; and Jones, Harold G., to Ecodyn Systems, Inc. Method of processing, transporting and storing meat. 3,898,854, Cl. 62-62.000.

Mead, Alan B.; Aker, John L.; Malan, David A.; and Alden, John R., to Kustom Electronics, Inc. Mobile computer terminal and system. 3,899,772, Cl. 340-152.000.

Mead, Stanley L.; and Dilley, Gerald G., to Mead, Stanley L. Tying machine. 3,898,924, Cl. 100-12.000.

Meanor, Doyle W.: *See—*
Chaparro, John J.; Ellis, Lowell V.; Meanor, Doyle W.; Morton, William D., Jr.; Richelmann, Bernd H.; Ross, George B.; and Toth, John E., 3,899,085.

Medico Electronic Inc.: *See—*
Morin, Leo G.; and Prox, Jerome R., 3,899,397.

Medico, John J., Jr. Solar heat collector. 3,898,979, Cl. 126-271.000.

Medley, Harold C.: *See—*
Chou, Albert S.; Tong, Yang Hu; Medley, Harold C.; and Dalziel, Warren L., 3,898,814.

Mefford, Albert L. Apparatus for determining the diameters of round objects. 3,898,740, Cl. 33-142.000.

Meier, Johann, to Premisure AG, Instrumente fur Prazisions-Messung. Measuring device. 3,899,255, Cl. 356-169.000.

Melander, Lars Paul. Article for postal conveyance, especially one allowing for a reply. 3,899,127, Cl. 229-73.000.

Melmelstein, Seymour, to Tyco Laboratories, Inc. Pressure transducer. 3,899,766, Cl. 338-42.000.

Menard, Louis. Method of compacting made-up ground and natural soil of mediocre quality. 3,898,844, Cl. 61-35.000.

Mendelevsky, Yakov Idelevich; Vaistub, Mikhail Efimovich; and Eglitis, Vilis Yanovich. Hydrostatic bearing. 3,899,222, Cl. 308-5.00R.

Meopta, narodni Podnik: *See—*
Paukert, Miloslav; and Schwarzova, Libuse, 3,899,242.

Mercer, Alec Victor: *See—*
Fleck, Fritz; Mercer, Alec Victor; Paver, Roger; and Schmid, Horst, 3,899,487.

Mercier, Jacques; and Lancon, Bernard, to Republic of France. Multistrand powder charge. 3,898,934, Cl. 102-100.000.

Merck & Co., Inc.: *See—*
O'Neill, Joseph L.; and Bondi, Joseph V., 3,899,580.
Shen, Tsung-Ying; Dorn, Conrad P., Jr.; and Li, Jorge P., 3,899,506.
Witzel, Bruce E., 3,899,529.

Mercola, Peter A.: *See—*
Yum, Dooho; Mercola, Peter A.; and Jacobs, William R., 3,899,742.

Messenger, Edward Tunstall; and Mather, Douglas Edward, to Albright & Wilson Ltd. Detergent concentrate. 3,899,448, Cl. 252-551.000.

Messier-Hispano: *See—*
Masclet, Jean; and Turiot, Andre, 3,899,147.

Mester, Michael L.; and Whiteman, Frank L., to United States Steel Corporation. Method and apparatus for spraying agglomerating powders. 3,899,131, Cl. 239-123.000.

Meyer, Walter: *See—*
Cappelle, Norman D.; Meyer, Walter; and Tap, Henry H., 3,898,879.

Mi-Jack Products, Inc.: *See—*
Lanigan, John J.; Glickman, Myron; and Hehn, Anthony H., 3,899,205.

Miceli, Gilbert F. Internal combustion engine performance efficiency analyzer and meter device. 3,898,876, Cl. 73-117.300.

Michaud, Inc.: *See—*
Stumpf, Elmer J.; and Mockabee, Allan D., 3,899,044.

Microwave Associates, Inc.: *See—*
Hine., Marion E.; and Benz, Konrad K., 3,899,759.

Midway Industries, Inc.: *See—*
Breford, Glenn H., 3,899,194.

Mieville, Andre, to Helka S.A. Expansion joint batten or packing of dilation joint. 3,899,261, Cl. 404-68.000.

Mikhailov, Boris Mikhailovich: *See—*
Povarov, Leonard Sergeevich; and Mikhailov, Boris Mikhailovich, 3,899,492.

Miles, Clifford Granville: *See—*
Birchall, James Derek; Cassidy, John Edward; Rolfe, Nicholas; and Miles, Clifford Granville, 3,899,342.

Miles Laboratories, Inc.: *See—*
Warren, Brian Thomas; and Spicer, John William, 3,899,513.

Miller, Everett L.; and Miller, Frank D. Apparatus for monitoring reaction end point. 3,899,782, Cl. 340-228.00R.

Miller, Frank D.: *See—*
Miller, Everett L.; and Miller, Frank D., 3,899,782.

Miller, Herman H., Jr.: *See—*
Lonneker, Neal A.; Miller, Herman H., Jr.; and Pigott, George M., 3,899,609.

Miller, Jacob I.; Dudley, Gaston E.; Blackwell, Philip A., Jr.; and Owens, Omer O., to United States of America, Army. Preparation of 3-quinuclidinyl benzilate. 3,899,497, Cl. 260-293.530.

Miller, Lindell L.: *See—*
Blomstrom, Gary D.; Miller, Lindell L.; and York, Lyle E., 3,899,218.

Miller, Miles C.: *See—*
Flatau, Abraham; Olson, Donald N.; and Miller, Miles C., 3,898,932.

Miller, Randall J. Insulated pipe anchor assembly. 3,899,007, Cl. 138-114.000.

Miller, Timothy A.; and Hansen, Carlo J., to Ralston Purina Company. Simulated bone. 3,899,607, Cl. 426-285.000.

Millett, Bradburne L., to White-Westinghouse Corporation. Pneumatic lifting mechanism. 3,899,187, Cl. 280-43.240.

Mims, Bruce L., to Branson Ultrasonics Corporation. Method of vibratory welding. 3,899,116, Cl. 228-110.000.

Minagi, Sakebu, to Mitsui Shipbuilding and Engineering Co., Ltd. Welding jig for deck longitudinals. 3,899,163, Cl. 269-37.000.

Minai, Kiichi; Inada, Isamu; Ozawa, Kenji; and Okochi, Kenji, to Murata Manufacturing Co., Ltd. Ferroelectric ceramic compositions. 3,899,435, Cl. 252-62.900.

Mine, Akihiko: *See—*
Tanaka, Shizuya; Ozaki, Toshiaki; Mine, Akihiko; Tanaka, Katsutoshi; Yamamoto, Sigeo; Ooishi, Tadashi; Hino, Naganori; and Satomi, Takeo, 3,899,582.

Mine Safety Appliances Company: *See—*
Davison, Ellison L.; and Ziegler, Leo D., 3,898,700.

Minnesota Mining and Manufacturing Company: *See—*
Gaudreault, Eugene H., 3,899,693.
Harrison, Brian G., 3,899,325.
Pihlstrom, Lance W., 3,899,380.
Schultz, Thomas E.; and Schuchardt, Peter W., 3,899,383.

Minnick, Leonard John; Webster, William C.; and Smith, Charles L., to IU Technology Corporation. Lime-fly ash-sulfite compositions. 3,899,345, Cl. 106-118.000.

Misato, Tomomasa; Huang, Keng Tang; Homma, Yasuo; Yoshida, Ryonosuke; Saito, Tadaomi; and Shimizu, Akira, to Rikagaku Kenkyusho Ajinomoto Co. Ltd. Fungicidal method for protecting a plant. 3,899,585, Cl. 424-274.000.

Mitani, Naoyuki: *See—*
Syoji, Masaaki; Ishihara, Goro; Hirose, Masao; Kubota, Hidenobu; and Mitani, Naoyuki, 3,899,530.

Mitchell, Abraham J., to Mitchell-Bradford Chemical Co., The. Compositions and methods for blackening hardened steel. 3,899,367, Cl. 148-6.240.

Mitchell-Bradford Chemical Co., The: *See—*
Mitchell, Abraham J., 3,899,367.

Mitsubishi Gas Chemical Company, Ltd.: *See—*
Suzuki, Takashi; and Naito, Susumu, 3,899,540.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Kondo, Kyozo; and Okimoto, Takeyoshi, 3,899,067.

Mitsui Shipbuilding and Engineering Co., Ltd.: *See—*
Minagi, Sakebu, 3,899,163.

Mitsuya, Yoshihide. Mechanical pencil. 3,899,256, Cl. 401-65.000.

Miura, Kitie. Endless rope sling. 3,899,206, Cl. 294-74.000.

Miura, Nobutaka: *See—*
Izumi, Soichi; Ashiura, Takeo; Ito, Yoshiji; and Miura, Nobutaka, 3,899,625.

Miura, Yoshitada: *See—*
Sekimoto, Yasuhiro; and Miura, Yoshitada, 3,899,020.

Miya, Bunji; Kasutani, Katsuji; Matsuda, Morio; Hashimoto, Akio; Nisigawa, Shiyozo; and Sawamoto, Youzi, to Kao Soap Co., Ltd. Process for preparing copper-chromium catalysts. 3,899,446, Cl. 252-467.000.

Miyake, Toshio; and Sato, Yoshinori, to Hayashibara Company. Process for the production of foods and drinks with the employment of maltobionic acid. 3,899,604, Cl. 426-590.000.

Miyawaki, Masaru: *See—*
Kimura, Hiroshi; Kusakabe, Kensuke; Tokuda, Katsuhiko; Miyawaki, Masaru; and Nakatani, Hiromi, 3,899,480.

Mizuguchi, Norio: *See—*
Aono, Shigeo; and Mizuguchi, Norio, 3,898,894.

Mizuno, William G.: *See—*
Copeland, James L.; and Mizuno, William G., 3,899,436.

MK Refrigeration Ltd.: *See—*
Komedera, Mieczyslaw, 3,898,856.

MKT-Techtaat OY: *See—*
Reijonen, Olavi; and Kostiainen, Lauri, 3,899,086.

Mobil Oil Corporation: *See—*
Bonacci, John C.; and Burgess, William P., 3,899,411.
Chang, Clarence D.; and Lang, William H., 3,899,544.
Chen, Nai Yuen; and Srinivasan, Sundaresa, 3,898,959.
Florian, John, 3,899,076.

Mockabee, Allan D.: *See—*
Stumpf, Elmer J.; and Mockabee, Allan D., 3,899,044.

Moder, Helmut: *See—*
Werner, Peter; Drews, Ulrich; Rittmannsberger, Norbert; Busse, Wolfgang; Moder, Helmut; and Ohr, Karl-Heinz, 3,898,964.

Modiano, Jacques: *See—*
Branlard, Paul; and Modiano, Jacques, 3,899,459.

Mohr, Reinhard: *See—*
Fleckenstein, Erwin; Mohr, Reinhard; and Heinrich, Ernst, 3,899,478.

Molina, Orlando G., to Rockwell International Corporation. Dye penetrant composition containing a volatile degreaser-type solvent. 3,899,450, Cl. 252-301.20P.

Monsanto Company: *See—*
Altemore, Joseph M.; and Ort, Morris R., 3,899,477.
Erickson, Floyd B., 3,899,334.
Harman, Marion W., 3,899,502.
Kerst, Al F., 3,899,528.
McGee, John W.; and King, Henry L., 3,899,470.
Petrovich, John P.; and Taylor, David L., 3,899,388.

Montone, Liber J.; and Pietruszynski, Leonard J., to Western Electric Company, Incorporated. Video controlled positioning method and apparatus. 3,899,634, Cl. 178-6.800.

Mookherjee, Braja Dulal; Vock, Manfred Hugo; Benaim, Carlos; and Shuster, Edward J., to International Flavors & Fragrances Inc. Altering raspberry flavored foodstuffs with 4-(2,6,6-trimethyl-1,3-cyclohexadien-1-yl)-2-butanol and/or 4-(6,6-dimethyl-2-methylene-3-cyclohexen-1-yl)-2-butanol, and/or acetates thereof. 3,899,597, Cl. 426-538.000.

Moore, Gordon G.: *See—*
Rothman, Edward S.; Hecht, Stephen S.; and Moore, Gordon G., 3,899,290.

Moore, John Paul. Boat top. 3,898,947, Cl. 114-71.000.

Moore, Warren A.: *See—*
Schuller, Fredrick T.; and Moore, Warren A., 3,899,224.

Morehead, Chalmers, to Westinghouse Electric Corporation. Method of providing a fluorescent lamp stem with an integral mercury-vapor pressure regulating means. 3,898,720, Cl. 29-25.130.

Morgan, Brian E., to Cobe Laboratories, Inc. Extra corporeal blood access site. 3,898,988, Cl. 128-214.00R.

Morgan, Thomas R.: *See—*
Frick, Douglas G.; Morgan, Thomas R.; and Streeter, Terry L., 3,899,568.

Mori, Eiko: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 3,899,464.

Morimura, Syoji: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 3,899,464.

Morin, Leo G.; and Prox, Jerome R., to Medico Electronic Inc. Glutamic oxalacetic transminase assay method. 3,899,397, Cl. 195-103.500.

Morita, Minoru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Structure of an exhaust manifold of a rotary engine. 3,898,804, Cl. 60-323.000.

Morita, Minoru: *See—*
Sasaki, Yoshio; and Morita, Minoru, 3,898,803.

Moriyama, Kazuyoshi: *See—*
Masai, Tadahisa; Adachi, Tetsuro; Sasaki, Shigeru; and Moriyama, Kazuyoshi, 3,899,266.

Morizane, Kenji: *See—*
Watanabe, Naozo; Morizane, Kenji; and Ayabe, Masaaki, 3,899,572.

Morris, Gilbert C., to Fred D. Pfening Company, The. In-line pressure sifter. 3,899,417, Cl. 209-243.000.

Morris, Harold D.; and Sigworth, Frederick J., to Systron Donner Corporation. Angular position sensing and control system, apparatus and method. 3,899,028, Cl. 172-4.500.

Morrison, Douglas Stewart: *See—*
Connelly, Thomas Macfarlane; Rowe, Ian George; and Morrison, Douglas Stewart, 3,899,427.

Morton-Norwich Products, Inc.: *See—*
Alaimo, Robert J.; and Goldenberg, Marvin M., 3,899,479.
Alaimo, Robert J.; and Storrin, Ronald J., 3,899,503.

Morton, William D., Jr.: *See—*
Chaparro, John J.; Ellis, Lowell V.; Meanor, Doyle W.; Morton, William D., Jr.; Richelmann, Bernd H.; Ross, George B.; and Toth, John E., 3,899,085.

Moskowitz, Gerard J.; Como, John J.; and Feldman, Louis I., to Baxter Laboratories, Inc. Lipolytic enzyme recovery method. 3,899,395, Cl. 195-66.00R.

Motoren- und Turbinen-Union Munchen GmbH: *See—*
Pollert, Wolfgang; Kraft, Eckhard; and Pennig, Gregor, 3,898,799.

Motoren-Werke Mannheim AG vorm. Benz Abt. stat. Motorenbau: *See—*
Kanzler, Hans-Joachim; and Reuchlein, Gunter, 3,898,841.

MSI Data Corporation: *See—*
Larsen, John M., 3,899,775.

Mueller, Falk, to VS-Schulmoebel Verwaltungs-GmbH. Chairs. 3,899,207, Cl. 297-239.000.

Muhlhausser, Martin; and Roth, Christian, to Swiss Aluminium Ltd. Cathode foil for electrolytic condensers. 3,899,723, Cl. 317-230.000.

Mulder, Hendrik, to N. V. Optische Industrie de Oude Delft. Device for viewing under water. 3,899,244, Cl. 351-43.000.

Muller, Hans Rudolf: *See—*
Jones, Ivor; Muller, Hans Rudolf; Wild, Daniel; and Zafiropulo, Pitro Alois, 3,899,642.

Multi-State Devices Ltd.: *See—*
Eastwood, H. Keith; and Noval, Barry A., 3,899,407.

Murata Manufacturing Co., Ltd.: *See—*
Minai, Kiichi; Inada, Isamu; Ozawa, Kenji; and Okochi, Kenji, 3,899,435.

Murata, Taneo, to Alps Electric Co., Ltd. Nodally operated push-button switch. 3,899,648, Cl. 200-5.00R.

Murata, Yuuji; Sato, Kuniaki; and Yonejima, Sigeru, to Nippon Steel Corporation. Rolling-type marking machine. 3,898,927, Cl. 101-110.000.

Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, to Sankyo Co., Ltd. Piperidine derivative and use thereof as stabilizers. 3,899,464, Cl. 260-45.8NZ.

Murphy, James V., to Electronic Molding Corporation. Integrated circuit panel and dual in-line package for use therewith. 3,899,719, Cl. 317-101.0CC.

Murray, Graeme Douglas, to Procter & Gamble Company, The. Process for manufacturing color-striped stamped detergent bars. 3,899,566, Cl. 264-245.000.

Myeress, Rudolph S., to Allied Steel & Tractor Products, Incorporated. Pipe target assembly. 3,898,743, Cl. 33-293.000.

Myers, John W., to Phillips Petroleum Company. Platinum-germanium-gold reforming catalyst and process. 3,899,413, Cl. 208-138.000.

N. V. Optische Industrie de Oude Delft: *See—*
Mulder, Hendrik, 3,899,244.

Nachsi, Zolman; and Zorger, Abraham. Button telephone lock guard. 3,899,647, Cl. 179-189.00D.

Nackmayr, Dietrich: *See—*
Dannert, Dietmar; Ihlenburg, Rainer; Nackmayr, Dietrich; Goetze, Rudolf; Kruger, Wolfgang; Peter, Hartmut; Westphal, Klaus; and Thuy, Hans-Joachim, 3,899,181.

Nadas, Gyula, to Knorr-Bremse GmbH. Automatic brake-wear resetting device. 3,899,053, Cl. 188-203.000.

Nagano, Toshihiro: *See—*
Takahashi, Toshiro; Nagano, Toshihiro; Aoshima, Yasuo; Suzuki, Matsuo; Suzuki, Shozo; and Asahina, Teruo, 3,899,370.

Nagayasu, Motokiyo: *See—*
Tokushige, Toshio; and Nagayasu, Motokiyo, 3,899,575.

Naito, Susumu: *See—*
Suzuki, Takashi; and Naito, Susumu, 3,899,540.

Nakagami, Takakiyo; Hatanaka, Kazunari; and Ishizaki, Masayuki, to Fujitsu Limited. Square turning meander line. 3,899,757, Cl. 333-31.00R.

Nakagawa, Sigeyosi: *See—*
Takao, Hiroshi; Togawa, Kinmochi; Abe, Satoshi; and Nakagawa, Sigeyosi, 3,899,555.

Nakai, Siyunzi; and Nakarai, Masazumi, to Sharp Kabushiki Kaisha. Magnetic card reader. 3,899,659, Cl. 235-61.11D.

Nakamoto, Soichi: *See—*
Taguchi, Tatsuya; Uchiyama, Takashi; Nakamoto, Soichi; and Ito, Tadashi, 3,899,789.

Nakamura, Kenya; and Sato, Akira, to Toyota Jidosha Kogyo Kabushiki Kaisha. Bearing system for gas turbine engine. 3,898,793, Cl. 60-39.080.

Nakano, Kazuhiko: *See—*
Yamada, Koichi; Hashimoto, Tadanori; and Nakano, Kazuhiko, 3,899,571.

Nakano, Seizo: *See—*
Kishi, Tuneo; and Nakano, Seizo, 3,899,650.

Nakarai, Masazumi: *See—*
Nakai, Siyunzi; and Nakarai, Masazumi, 3,899,659.

Nakatani, Hiromi: *See—*
Kimura, Hiroshi; Kusakabe, Kensuke; Tokuda, Katsuhiko; Miyawaki, Masaru; and Nakatani, Hiromi, 3,899,480.

Nashivanko, Vitaly Dmitrievich: *See—*
Borisenko, Gleb Pavlovich; Chernobrivenko, Jury Sergeevich; Kutsov, Jury Georgievich; Gorbanev, Arkady Alexeevich; Kukushkin, Oleg Nikolaevich; Krivobokov, Vladimir Nikolaevich; Pobegailo, Grigory Gavrilovich; and Nashivanko, Vitaly Dmitrievich, 3,898,830.

Nathanson, Albert. Two position lighting device. 3,899,669, Cl. 240-10.60R.

National Research Development Corporation: *See—*
Richmond, William, 3,899,376.

National Semiconductor Corporation: *See—*
Solomon, James E.; and Zias, Arthur R., 3,899,695.

National Starch and Chemical Corporation: *See—*
Rutenberg, Morton W.; Tessler, Martin M.; and Kruger, Leo, 3,899,602.

National Steel Products Company: *See—*
Matlock, Robert B.; Wilmer, Reginald B.; and Ferguson, Dale L., 3,898,783.

Nauta, Constant Johan, to Nautamix Patent A.G. Device for treating substances consisting of at least one vessel and one or more stirring members in each vessel. 3,899,159, Cl. 259-21.000.

Nautamix Patent A.G.: *See—*
Nauta, Constant Johan, 3,899,159.

NCR Corporation: *See—*
Roberts, Donald L., 3,899,778.

Nelson, Bertel S.: *See—*
Keyes, Richard M.; and Nelson, Bertel S., 3,898,866.

Nelson, Robert L.; and Nelson, Susan J. Tension band. 3,898,713, Cl. 24-73.0SA.

Nelson, Susan J.: *See—*
Nelson, Robert L.; and Nelson, Susan J., 3,898,713.

Nestor, John W., Jr., to Polaroid Corporation. Multilayer film pack with scratch reducing means. 3,899,337, Cl. 96-76.00C.

Neubert, Rolf: *See—*
Wehling, Rolf; and Neubert, Rolf, 3,898,787.

Neuman, Richard, to Eaton Corporation. Piston cylinder assembly. 3,898,915, Cl. 91-395.000.

Neville, Richard Ernest Gartside; and Garrett, John Austin, to AMF Incorporated. Tobacco moistening method open cores. 3,898,996, Cl. 131-136.000.

Newbould, John; Eusebi, Elio; and Bobalek, Edward G., to General Motors Corporation. Reinforced polyamide molding composition. 3,899,462, Cl. 260-37.00N.

Newcombe, Jack, to Cities Service Company. Flame-retardant composition. 3,899,463, Cl. 260-45.70R.

Newman, Alec T.: *See—*
Lack, Bryan E. C.; and Newman, Alec T., 3,899,102.

Newman, Raymond. Adjustable floor support for needlecraft and art frames. 3,899,164, Cl. 269-71.000.

Nickerson, John T. R.; and Darack, John R., to Dirigo Corporation. Food preservation. 3,899,594, Cl. 426-9.000.

Nihon Kensetsu Kikai Sangyo Kabushiki Kaisha: *See—*
Yamamoto, Shinzo, 3,899,262.

Nipki "Leyarska Technika": *See—*
Alexandrov, Alexander Damyanov; Trifonov, Todor Kostov; Stefanov, Stefan Ivanov; Apostolov, Paskal Spasov; and Deshev, Mincho Borislavov, 3,899,021.

Nippon Electric Company, Limited: *See—*
Ueno, Yoshito; Kajitani, Mitsuo; and Ohgushi, Yoshio, 3,899,429.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Matsuda, Hideki, 3,899,186.

Nippon Kogaku K.K.: *See—*
Toyoda, Kenji, 3,899,788.

Nippon Steel Corporation: *See—*
Izumi, Soichi; Ashiura, Takeo; Ito, Yoshiji; and Miura, Nobutaka, 3,899,625.
Murata, Yuuji; Sato, Kuniaki; and Yonejima, Sigeru, 3,898,927.

Nisigawa, Shiyozo: *See—*
Miya, Bunji; Kasutani, Katsuji; Matsuda, Morio; Hashimoto, Akio; Nisigawa, Shiyozo; and Sawamoto, Youzi, 3,899,446.

Nissan Motor Company Limited: *See—*
Aono, Shigeo; and Mizuguchi, Norio, 3,898,894.
Ariga, Hajime, 3,898,794.
Iwata, Hiroyoshi; Sekiguchi, Koichi; and Ishikawa, Yoshikazu, 3,898,963.
Maeda, Teruo; Shimoe, Hideo; Fujiwara, Yasuhiko; Aya, Norimoto; Marumo, Nagayuki; Tsuji, Heigo; and Sakamoto, Yuzo, 3,899,047.
Ohba, Motoichi; and Chiba, Keiichi, 3,898,810.
Takao, Hiroshi; Togawa, Kinmochi; Abe, Satoshi; and Nakagawa, Sigeyosi, 3,899,555.

Nitto Electric Industrial Co., Ltd.: *See—*
Hori, Yutaka; Yoshikawa, Nobuharu; and Ohmori, Saburo, 3,899,677.

NL Industries, Inc.: *See—*
Bush, Harley E., 3,899,293.
Loeffler, Otto Ernest, 3,899,522.

Nohe, Heinz; and Beck, Fritz, to BASF Aktiengesellschaft. Electrochemical production of pinacols. 3,899,401, Cl. 204-59.00R.

Noice, Frank M. Backpack frame with handles. 3,899,109, Cl. 224-25.00A.

Nolan, John L., to Hollister Incorporated. Ostomy seal and method of making the same. 3,898,990, Cl. 128-283.000.

Noranda Mines Limited: *See—*
Stanley, Robert W., 3,899,284.

Nordstrom, Arnold B. Cargo-carrying structural modules. 3,899,092, Cl. 214-84.000.

Norlie, Bruce; and Bradbury, Bernard G., to Rexnord Inc. Car turner. 3,898,935, Cl. 104-37.000.

Normbau GmbH Maschinen-Papparate-Werkzeuge & Co.: *See—*
Frauendorf, Manfred, 3,899,108.

Norton, Michael George: *See—*
Rowe, Frederick; Norton, Michael George; and Fairweather, John Anthony, 3,899,412.

Noval, Barry A.: *See—*
Eastwood, H. Keith; and Noval, Barry A., 3,899,407.

Novotny, Raymond J.: *See—*
Huntress, Howard B.; and Novotny, Raymond J., 3,899,054.

Nozawa, Masao; Yasuno, Takehiko; Yamaguchi, Takashi; and Uenoyama, Hiroshi, to Japan Atomic Energy Research Institute; and Japan Gasoline Co., Ltd. Steam reformer for hydrocarbons. 3,899,420, Cl. 196-129.000.

Nufer, Robert W.: *See—*
Kaiser, Harold D.; and Nufer, Robert W., 3,899,554.

Nychka, Henry R., to Allied Chemical Corporation. Process for coupling iodoperhalo compounds. 3,899,541, Cl. 260-648.00F.

Nystuen, Arne M.: *See—*
Knoop, Donald E.; Loessel, Marc C.; and Nystuen, Arne M., 3,898,875.

Oak Industries, Inc.: *See—*
Cappelle, Norman D.; Meyer, Walter; and Tap, Henry H., 3,898,879.

Oberlinner, Andreas: *See—*
Baumann, Hans; and Oberlinner, Andreas, 3,899,514.

O'Brian, Edward D. Water emitter. 3,899,135, Cl. 239-534.000.

O'Brien, William J.; and Sakal, John, to Standard Register Company, The. Direct mail advertising booklet and method of production. 3,899,381, Cl. 156-204.000.

Oda, Osamu; Sakai, Kiyoshi; Yusa, Takashi; and Katano, Hamako, to Sankyo Company Limited. 9ξ,15ξ-Dihydroxy-11α-hydroxymethyl-prost-13(trans)-enoic acid derivatives. 3,899,525, Cl. 260-463.000.

Oelschlager, Herbert; Matthiesen, Uwe; and Behrendt, Wilhelm A., to Temmler-Werke, Firma. 2H-indazolone compound. 3,899,488, Cl. 260-247.5EP.
Ogasawara, Tatsuo: *See—*
Sasaki, Rentaro; Watanabe, Akinori; Ikegame, Mamoru; and Ogasawara, Tatsuo, 3,899,707.
Ogawa, Takashi; Sugiyama, Shunichi; and Kida, Kiyonori, to Fuji Denki Seizo Kabushiki Kaisha. Small A.C. electric motor. 3,899,701, Cl. 310-40.0MM.
Ohba, Motoichi; and Chiba, Keiichi, to Nissan Motor Company Limited. Tandem pump unit. 3,898,810, Cl. 60-413.000.
Ohgushi, Yoshio: *See—*
Ueno, Yoshito; Kajitani, Mitsuo; and Ohgushi, Yoshio, 3,899,429.
Ohio Knife Company: *See—*
Greene, Charles H., 3,898,729.
Ohlswager, Stanley; Edison, Robert R.; and Dresser, Thorpe, to Atlantic Richfield Company. Liquid-vapor distributor. 3,899,000, Cl. 137-561.00A.
Ohmori, Saburo: *See—*
Hori, Yutaka; Yoshikawa, Nobuharu; and Ohmori, Saburo, 3,899,677.
Ohnuma, Kiyoshi: *See—*
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Ohr, Karl-Heinz: *See—*
Werner, Peter; Drews, Ulrich; Rittmannsberger, Norbert; Busse, Wolfgang; Moder, Helmut; and Ohr, Karl-Heinz, 3,898,964.
Ohta, Noriyuki: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 3,899,464.
Ohta, Yoshimoto, to Tokico Limited. Hydraulic brake pressure control valve unit. 3,899,217, Cl. 303-24.00C.
Oiestad, Andrew, to Tank Sapp (UK) Ltd. Inert gas system and method for tankers. 3,899,099, Cl. 220-88.00B.
Okada, Nobuhiko; and Suzuki, Teruaki, to Osaka Gas Kabushiki Kaisha; and Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho. Crushing apparatus. 3,899,139, Cl. 241-68.000.
Okamoto, Miyoshi: *See—*
Okazaki, Kaoru; Yagi, Kenkichi; Okamoto, Miyoshi; Watanabe, Koji; Hikota, Toyohiko; and Kubo, Masayoshi, 3,899,292.
Okamoto, Takanori: *See—*
Matsuda, Hideaki; and Okamoto, Takanori, 3,899,382.
Okamoto, Tsuyoshi; Kawaguchi, Yoichi; and Kai, Takayuki, to Toyo Boseki Kabushiki Kaisha. Method of producing bundled multifilament yarn. 3,899,614, Cl. 427-175.000.
Okaya Electric Industry Co., Ltd.: *See—*
Sasaki, Rentaro; Watanabe, Akinori; Ikegame, Mamoru; and Ogasawara, Tatsuo, 3,899,707.
Okazaki, Kaoru; Yagi, Kenkichi; Okamoto, Miyoshi; Watanabe, Koji; Hikota, Toyohiko; and Kubo, Masayoshi, to Toray Industries, Inc. Process for crumpling synthetic suede. 3,899,292, Cl. 8-17.000.
Okazaki, Kaoru; Yagi, Kenkichi; Ichimura, Akira; and Masubuchi, Yoshinori, to Toray Industries, Inc. Synthetic leather combination of needle-punched fabric and polyetherester polyurethane. 3,899,623, Cl. 428-290.000.
Oki Electric Industry Co., Ltd.: *See—*
Sasaki, Rentaro; Watanabe, Akinori; Ikegame, Mamoru; and Ogasawara, Tatsuo, 3,899,707.
Okimoto, Takeyoshi: *See—*
Kondo, Kyozo; and Okimoto, Takeyoshi, 3,899,067.
Okochi, Kenji: *See—*
Minai, Kiichi; Inada, Isamu; Ozawa, Kenji; and Okochi, Kenji, 3,899,435.
Okuno, Yoshitoshi; and Hirano, Masachika, to Sumitomo Chemical Company, Limited. Synergistic chrysanthemate insecticides. 3,899,586, Cl. 424-274.000.
Olin Corporation: *See—*
Magiros, Peter G., 3,899,294.
Sieckhaus, John F.; Scott, Robert N.; and Larchar, Trescott B., 3,899,456.
van Leuwen, Bruce G.; and Pitts, James J., 3,899,520.
Olin Ski AG: *See—*
Brack, Jacques, 3,899,113.
Oliver, Evan M.; and Marsilio, Joseph V., to Bethlehem Steel Corporation. Method of producing a vaccum treated effervescing boron steel. 3,899,321, Cl. 75-49.000.
Olsen, Frederick C.: *See—*
Tamble, George D.; and Olsen, Frederick C., 3,899,087.
Olson, Donald N.: *See—*
Flatau, Abraham; Olson, Donald N.; and Miller, Miles C., 3,898,932.
Olympus Optical Co., Ltd.: *See—*
Ikuno, Yuji; and Kato, Yutaka, 3,898,991.
Omni Spectra, Inc.: *See—*
McHenry, Vincent J., 3,899,784.
O'Neill, Joseph L.; and Bondi, Joseph V., to Merck & Co., Inc. Anti-inflammatory topical gel. 3,899,580, Cl. 424-241.000.
Ong, Algernon M.: *See—*
Mandel, Louis; Ong, Algernon M.; and Singer, Paul, 3,898,984.
Ooishi, Tadashi: *See—*
Tanaka, Shizuya; Ozaki, Toshiaki; Mine, Akihiko; Tanaka, Katsutoshi; Yamamoto, Sigeo; Ooishi, Tadashi; Hino, Naganori; and Satomi, Takeo, 3,899,582.
Oraltechnic Anstalt: *See—*
Spinnato, Gaetano Emanuele, 3,899,653.
Orbanic, Robert S.: *See—*
Bennett, John E.; Jayne, Max L.; and Orbanic, Robert S., 3,898,967.
Ore-Ida Foods, Inc.: *See—*
Green, Glen R., 3,899,273.
Orme, Myrl E., to Bendix Corporation, The. Multi-path valve structure. 3,899,001, Cl. 137-625.300.
Ort, Morris R.: *See—*
Altemore, Joseph M.; and Ort, Morris R., 3,899,477.
Osaka Gas Kabushiki Kaisha: *See—*
Okada, Nobuhiko; and Suzuki, Teruaki, 3,899,139.
Osawa, Hisayou: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 3,899,464.
Osborn, Merlin L.; Crytzer, Layton D.; and Stewart, Donald M., to Allegheny Ludlum Industries, Inc. Apparatus for compensating for instrumentation loss. 3,899,733, Cl. 324-34.00R.
Otala, Matti Niilo Tapani, to U.S. Philips Corporation. Magnetic bubble store having optical centering apparatus. 3,899,780, Cl. 340-174.0YC.
Ott, Hans; and Suess, Rudolf, to Sandoz Ltd. Substituted 6-phenyl benzo-naphthyridines. 3,899,494, Cl. 260-287.00R.
Ottle, J. C.: *See—*
Polen, Karl; and Ottle, J. C., 3,899,034.
Ovard, John C.: *See—*
Furlong, Donn B.; and Ovard, John C., 3,899,553.
Overhoff, Mario W. Apparatus and method for automatic cross correlation interferometry. 3,899,253, Cl. 356-108.000.
Ovshinsky, Stanford R.: *See—*
Fleming, Gordon R.; and Ovshinsky, Stanford R., 3,899,558.
Owens-Corning Fiberglas Corporation: *See—*
Foley, Kevin M.; and Vigo, Francesco M., 3,899,524.
Owens-Illinois, Inc.: *See—*
Fradkin, Eli H., 3,899,120.
Owens, Omer O.: *See—*
Miller, Jacob I.; Dudley, Gaston E.; Blackwell, Philip A., Jr.; and Owens, Omer O., 3,899,497.
Oxenrider, Bryce C.; and Woolf, Cyril, to Allied Chemical Corporation. Synthetic fibers having improved soil and stain repellency. 3,899,563, Cl. 264-211.000.
Ozaki, Toshiaki: *See—*
Tanaka, Shizuya; Ozaki, Toshiaki; Mine, Akihiko; Tanaka, Katsutoshi; Yamamoto, Sigeo; Ooishi, Tadashi; Hino, Naganori; and Satomi, Takeo, 3,899,382.
Ozawa, Kenji: *See—*
Minai, Kiichi; Inada, Isamu; Ozawa, Kenji; and Okochi, Kenji, 3,899,435.
Ozone Incorporated: *See—*
Tenney, Robert I., 3,899,684.
Packard Instrument Company Inc.: *See—*
Packard, Lyle E., 3,899,673.
Packard, Lyle E., to Packard Instrument Company Inc. Data processing system employing quench simulation for enabling accurate computation of sample activity levels in liquid scintillation spectrometry. 3,899,673, Cl. 250-328.000.
Padgett, John, Jr. Spindle adapter. 3,899,141, Cl. 242-46.400.
Pagani, Hermes: *See—*
Coronelli, Carolina; Bardone, Maria Rosa; and Pagani, Hermes, 3,899,396.
Paik, Young H.: *See—*
Fukuta, Norikiko; and Paik, Young H., 3,899,129.
Paioletti, Jose. Lock-structures. 3,899,201, Cl. 292-25.000.
Palmer, Malcolm George, to Erco Industries Ltd. Metallic phosphide composition for use in aquatic flares. 3,899,375, Cl. 149-29.000.
Palmer, Richard F. Combination doll and marionette. 3,898,764, Cl. 46-126.000.
Palmer, William Edward, to Vibixa Limited. Cartons and blanks for forming cartons. 3,899,126, Cl. 229-51.0TC.
Pampus KG, Firma: *See—*
Harig, Friedrich, 3,899,227.
Pantier, Earl A.: *See—*
Jackovitz, John F.; and Pantier, Earl A., 3,899,350.
Parks, Lloyd, deceased; and Brown, Dwight C. Game apparatus with spinnable target. 3,899,170, Cl. 273-38.000.
Pasquini, Daniel, to Caterpillar Tractor Co. Combined tractor steering clutch and brake control system. 3,899,058, Cl. 192-13.00R.
Patrie, Jos; Lefebvre, Jacques; and Allegret, Francois, to Produits Chimiques Ugine Kuhlmann. Surface treatment of aluminum and its alloys. 3,899,400, Cl. 204-33.000.
Paukert, Miloslav; and Schwarzova, Libuse, to Meopta, narodni Podnik. Reproduction lens system. 3,899,242, Cl. 350-216.000.
Paver, Roger: *See—*
Fleck, Fritz; Mercer, Alec Victor; Paver, Roger; and Schmid, Horst, 3,899,487.
Paweck AG: *See—*
Eckold, Gerd-Jurgen; and Maass, Hans, 3,898,832.
Payakov, Stefan Georgiev: *See—*
Makedonski, Boris Georgiev; Kochemidov, Atanas Dimitrov; Dumanov, Ivan Minkov; and Payakov, Stefan Georgiev, 3,898,769.
Payne, Peter R. Heat engine in the form of a water pulse-jet. 3,898,800, Cl. 60-227.000.
Pennig, Gregor: *See—*
Pollert, Wolfgang; Kraft, Eckhard; and Pennig, Gregor, 3,898,799.

Pennwalt Corporation: *See—*
Walter, Gerald Joseph, 3,899,484.

Pepperman, Armand B., Jr.: *See—*
Daigle, Donald J.; Pepperman, Armand B., Jr.; and Boudreaux, Gordon J., 3,899,618.
Daigle, Donald J.; Pepperman, Armand B., Jr.; and Vail, Sidney L., 3,899,619.

Peres, Anthony R., to Peres Electronic Machines, Inc. Method and apparatus for opening barrels. 3,898,898, Cl. 82-47.000.

Peres, Anthony R., to Peres Electronic Machines, Inc. Automatic random case coder. 3,898,926, Cl. 101-37.000.

Peres Electronic Machines, Inc.: *See—*
Peres, Anthony R., 3,898,898.
Peres, Anthony R., 3,898,926.

Perieres, Jacques A. Device for checking the content of hydrocarbons in a mixture of water and hydrocarbons. 3,899,688, Cl. 250-576.000.

Perkins, James B.: *See—*
Malobicky, Rudolph L., Jr.; Perkins, James B.; and Taylor, Robert H., 3,899,241.

Permag Magnetics Corporation: *See—*
Studders, Robert J., 3,899,762.

Persson, Sixten Ismael, to Luftkonditionering AB. Method and plant for regulating temperature by means of a subtempered air flow. 3,899,022, Cl. 165-22.000.

Peter, Hartmut: *See—*
Dannert, Dietmar; Ihlenburg, Rainer; Nackmayr, Dietrich; Goetze, Rudolf; Kruger, Wolfgang; Peter, Hartmut; Westphal, Klaus; and Thuy, Hans-Joachim, 3,899,181.

Peterkofsky, Alan L.; Tracy, James E.; and Schumacher, Paul M., to Celanese Corporation. Etherified methylolated 2,7-dioxo-4,5-dimethyl-decahydro-pyrimido-[4,5-D]-pyrimidine and its use in alkyd resin coating compositions. 3,899,457, Cl. 260-21.000.

Peterkofsky, Alan L.; Tracy, James E.; and Schumacher, Paul M., to Celanese Corporation. Etherified trimethylolated crotonylidenediurea and its use in alkyd resin coating compositions. 3,899,458, Cl. 260-21.000.

Peters, Henry G., Jr.; and Schuessler, Philipp W. H., to International Business Machines Corporation. Water soluble solder resist. 3,899,339, Cl. 106-2.000.

Petersen, Harro; Fuchs, Friedrich; and Scharwaechter, Peter, to BASF Aktiengesellschaft. N-(dialkylphosphonoalkyl)-carbamic acid alkyl esters. 3,899,548, Cl. 260-932.000.

Petersen, Harro; Fuchs, Friedrich; and Scharwaechter, Peter, to BASF Aktiengesellschaft. Poly(dialkylphosphonoalkyl)carbamates. 3,899,549, Cl. 260-932.000.

Peterson, Noel C., to Westinghouse Electric Corporation. Package for microwave integrated circuits. 3,899,720, Cl. 317-101.00D.

Peterson, Rune: *See—*
Hamrin, Bo Goran; and Peterson, Rune, 3,899,287.

Petersson, Stig Arvid, to Boliden Aktiebolag. Gas purification method. 3,899,308, Cl. 55-8.000.

Petro-Tex Chemical Corporation: *See—*
Barone, Bruno J., 3,899,518.

Petrovich, John P.; and Taylor, David L., to Monsanto Company. Treating compositions. 3,899,388, Cl. 162-164.000.

Petty-Ray Geophysical, Inc.: *See—*
Codding, Elias H.; and King, Hoyd S., Jr., 3,899,415.
Quay, Roy Gibson; and Ray, Clifford Harvey, 3,899,768.

Peyer, Siegfried: *See—*
Schwartz, Hermann, 3,898,717.

Peyser, Harry A.; and Heaviside, Robert D., to Continental Can Company, Inc. Plastic end cap and paper body attachment. 3,899,117, Cl. 229-5.500.

Pfannenschmidt, Carl: *See—*
Benecke, Theodor; Wiebke, Gunter; and Pfannenschmidt, Carl, 3,899,320.

Pfizer Inc.: *See—*
Curtiss, Alan C., 3,899,011.
Richards, Hugh C., 3,899,490.

Pfleger, Frederick W.: *See—*
Samson, Marvin S.; and Pfleger, Frederick W., 3,899,010.

Pharmacia Aktiebolag: *See—*
Swanbeck, Gunnar P. E.; Zetterberg, Gosta L.; and Agback, Karl Hubert, 3,899,591.

Pharriss, Bruce B., to Upjohn Company, The. Use of prostaglandins E and F for abortion. 3,899,587, Cl. 424-305.000.

Phillips Petroleum Company: *See—*
Holtz, Hans D., 3,899,537.
Hudson, Jimmie E.; and Dean, Jimmie L., 3,899,279.
Myers, John W., 3,899,413.

Piacente, Luigi; and Capannini, Sanzio, to Societa Italiana Telecomunicazioni Siemens S.p.A. Device for blocking toll calls from subscriber telephones. 3,899,640, Cl. 179-18.0DA.

Pickles, Joseph, to Ferro Manufacturing Corporation. Automotive side door latch. 3,899,202, Cl. 292-216.000.

Pietruszynski, Leonard J.: *See—*
Montone, Liber J.; and Pietruszynski, Leonard J., 3,899,634.

Pigott, George M.: *See—*
Lonneker, Neal A.; Miller, Herman H., Jr.; and Pigott, George M., 3,899,609.

Pihlstrom, Lance W., to Minnesota Mining and Manufacturing Company. Method of making acoustical material. 3,899,380, Cl. 156-181.000.

Pillsbury Company, The: *See—*
Forkner, John H., 3,899,606.

Pirlet, Robert Alfred, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Measuring dimensions of sections. 3,899,663, Cl. 235-151.320.

Pittman Products, Inc.: *See—*
Schuler, Manfred, 3,898,705.

Pitts, James J.: *See—*
van Leuwen, Bruce G.; and Pitts, James J., 3,899,520.

Plaettner, Rolf: *See—*
Grabmaier, Josef; and Plaettner, Rolf, 3,899,313.

Plante, Franklin T.: *See—*
Craig, David R.; Lederle, George M.; and Plante, Franklin T., 3,899,369.

Platt International Limited: *See—*
Blackburn, Reginald Mayman; and Airey, Harold Edwin, 3,898,712.

Plevak, Lubomir; Bekcer, Kunibert; Wojaczek, Egon; and Holken, Norbert, to Gewerkschaft Eisenhutte Westfalia. Mineral mining installations. 3,898,845, Cl. 61-45.00D.

Ploger, Walter: *See—*
Schindler, Norbert; and Ploger, Walter, 3,899,496.

Plunkett, Allan B., to General Electric Company. Braking effort control. 3,899,725, Cl. 318-227.000.

Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See—*
Champleboux, Jacques; and Delaux, Robert, 3,899,006.

Pobegailo, Grigory Gavrilovich: *See—*
Borisenko, Gleb Pavlovich; Chernobrivenko, Jury Sergeevich; Kutsov, Jury Georgievich; Gorbanev, Arkady Alexeevich; Kukushkin, Oleg Nikolaevich; Krivobokov, Vladimir Nikolaevich; Pobegailo, Grigory Gavrilovich; and Nashivanko, Vitaly Dmitrievich, 3,898,830.

Pocachard, Alain, to Le Nickel; Centre National pour l'Exploitation des Oceans; and Erji, part interest to each. Apparatus for taking underwater pictures. 3,899,790, Cl. 354-64.000.

Poeschel, Eva: *See—*
Heide, Helmut; Hoffmann, Ulrich; Brotz, Gunther; and Poeschel, Eva, 3,899,556.

Pohl, Karl-Heinz: *See—*
Borchard, Edwin Harley; and Pohl, Karl-Heinz, 3,899,721.

Polaroid Corporation: *See—*
Bloom, Stanley M.; and Hadzekyriakides, Nicholas S., 3,899,331.
Bloom, Stanley M.; and Garcia, Paulina P., 3,899,511.
Chiklis, Charles K., 3,899,355.
Land, Edwin H., 3,899,336.
Nestor, John W., Jr., 3,899,337.

Polen, Karl; and Ottle, J. C., to Alliance Machine Company, The. Weighing system. 3,899,034, Cl. 177-151.000.

Pollard, Orray R. Roller mechanism for conveying systems. 3,899,063, Cl. 193-35.00A.

Pollert, Wolfgang; Kraft, Eckhard; and Pennig, Gregor, to Motoren- und Turbinen-Union Munchen GmbH. Device for bleeding-off compressor air in turbine jet engine. 3,898,799, Cl. 60-226.00R.

Ponzoni, George Bernard: *See—*
Fischer, Valentine J.; Ponzoni, George Bernard; and Tressler, Charles J., 3,899,598.

Poole, Charles W., to Westinghouse Electric Corporation. Dual mode electric vehicle for road or rail track operation. 3,898,938, Cl. 105-215.00C.

Posselt, Heinz, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Doctor blade multiple-point control. 3,898,931, Cl. 101-365.000.

Povarov, Leonard Sergeevich; and Mikhailov, Boris Mikhailovich. Process for the production of substituted 1,2-dihydroquinolines. 3,899,492, Cl. 260-283.0SY.

PPG Industries, Inc.: *See—*
Heithoff, Robert B., 3,899,317.
Malobicky, Rudolph L., Jr.; Perkins, James B.; and Taylor, Robert H., 3,899,241.

Pranis, Peter P., Jr. Open water fish farming apparatus. 3,898,958, Cl. 119-3.000.

Pratt, Winthrop B., to Curtiss-Wright Corporation. Rotary mechanism having apex seals with low contact pressure. 3,899,272, Cl. 418-113.000.

Premisure AG, Instrumente fur Prazisions-Messung: *See—*
Meier, Johann, 3,899,255.

Press, Robert J., to Sargent Industries, Inc. Noise reduction apparatus. 3,898,806, Cl. 60-330.000.

Pressman, D. R.: *See—*
Loe, James M., 3,899,175.

Priebe, Frank D.: *See—*
Rees, Thomas E.; and Priebe, Frank D., 3,899,032.

Priehe, Frank D.: *See—*
Kelseaux, Ray M.; Dobbs, Harold J.; and Priehe, Frank D., 3,898,880.

Prino, Giuseppe: *See—*
Butti, Adriano; Prino, Giuseppe; and Bertellini, Gianfranco, 3,899,481.

Procter & Gamble Company, The: *See—*
Murray, Graeme Douglas, 3,899,566.

Production Data Inc.: *See—*
Tonnelli, Gerald J.; Epiling, Karol E.; and Ahrens, James R., 3,899,024.

Produits Chimiques Ugine Kuhlmann: *See—*
Demarcq, Michel, 3,899,550.
Patrie, Jos; Lefebvre, Jacques; and Allegret, Francois, 3,899,400.

Prokopius, Paul R., to United States of America, National Aeronautics and Space Administration. Flow measuring apparatus. 3,898,882, Cl. 73-194.00M.

Promecam Sisson-Lehmann: *See—*
Cailloux, Paul, 3,898,902.

Prox, Jerome R.: *See—*
Morin, Leo G.; and Prox, Jerome R., 3,899,397.

Pryde, Coralie Anne: *See—*
Chandross, Edwin Arthur; Pryde, Coralie Anne; and Salmon, Warren Allen, 3,899,678.

Przezdziecki, Wojciech Maria, to Eastman Kodak Company. Diazotype elements and processes with carbodiimide dehydrating agents to generator couplers. 3,899,335, Cl. 96-49.000.

Puck, Alfred, to Ciba-Geigy Corporation. High voltage insulator assembly fitted with pivotal mounting means for said insulator. 3,899,630, Cl. 174-43.000.

Pudlo, Zygmunt: *See—*
Wills, Peter; and Pudlo, Zygmunt, 3,898,912.

Pukaite, Clifford Joseph, to Globe-Union Inc. Low temperature coefficient of resistivity cermet resistors. 3,899,449, Cl. 252-518.000.

Pullman Incorporated: *See—*
Glassmeyer, John J., 3,898,873.

Purification Sciences Inc.: *See—*
Lowther, Frank E., 3,899,683.
Lowther, Frank Eugene, 3,899,682.

Putman, Thomas H., to Westinghouse Electric Corporation. Braking system for a multi-car vehicle. 3,899,216, Cl. 303-21.00A.

Quay, Roy Gibson; and Ray, Clifford Harvey, to Petty-Ray Geophysical, Inc. Method of seismic surveying by extracting and displaying seismic properties. 3,899,768, Cl. 340-15.5DS.

R. R. Donnelley & Sons Co.: *See—*
Abram, Stewart J.; Denis, David R.; Heinze, Alex E.; Johnson, Leonard M.; and Taylor, Edward, 3,899,165.

Racquet, Herschel J. Self-righting mailbox support. 3,899,150, Cl. 248-145.000.

Rader Companies, Inc.: *See—*
Stupfel, Clifford L., 3,899,214.

Ralston Purina Company: *See—*
Miller, Timothy A.; and Hansen, Carlo J., 3,899,607.

Rambold, Adolf. Infusion bag, particularly for tea. 3,899,599, Cl. 426-82.000.

Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Alkyl alkanoate derivatives of substituted piperazines and polymer compositions stabilized thereby. 3,899,491, Cl. 260-268.0TR.

Rami Art, Corporation: *See—*
Zohar, Rami, 3,898,761.

Rampe, John F., to Rampe Research. Continuous feed vibratory finishing method with discharge rate controlled by operation of tub discharge closure. 3,898,774, Cl. 51-313.000.

Rampe Research: *See—*
Rampe, John F., 3,898,774.

Rapp, Herbert. Recovery of powder in an electrostatic powder spraying operation. 3,899,311, Cl. 55-283.000.

Rau, Peter: *See—*
Klein, Klaus-Wilhelm; and Rau, Peter, 3,899,390.

Ravera, Giovanni; and Siletto, Giorgio, to Ing. C. Olivetti & C., S.p.A. Copy sheet drying and delivering device for reprographic machine. 3,899,792, Cl. 354-320.000.

Ray, Clifford Harvey: *See—*
Quay, Roy Gibson; and Ray, Clifford Harvey, 3,899,768.

Raybestos-Manhattan, Inc.: *See—*
D'Olier, George, 3,899,300.

Raytheon Company: *See—*
Kemp, Wayne T., 3,898,975.
Simone, Joseph D., 3,899,667.
Unkauf, Manfred G.; Harris, Derek V.; and Gustafsson, Sven G., 3,899,740.

RCA Corporation: *See—*
Bolger, Thomas Vincent, 3,899,666.
Goodman, Robert, 3,898,702.
Ladany, Ivan; and Cannuli, Vincent Michael, 3,899,371.
Steckler, Steven Alan; and Limberg, Allen Leroy, 3,899,635.

Readhead, Michael John: *See—*
Lewis, John William; and Readhead, Michael John, 3,899,510.

Reckitt & Colman Products Limited: *See—*
Lewis, John William; and Readhead, Michael John, 3,899,510.

Reddaway, Walter W. Splash and spray reducing device for a vehicle. 3,899,192, Cl. 280-154.50R.

Redford, Ronald Albert: *See—*
Francis, Peter Douglas; Redford, Ronald Albert; Gale, Philip Franklin; and Hillis, Maurice Raymond, 3,899,685.

Reed, Robert T.: *See—*
Gobrecht, George W.; and Reed, Robert T., 3,899,084.

Rees, Thomas E.; and Priebe, Frank D., to Cities Service Oil Company. Method and apparatus for deviating conductor casing. 3,899,032, Cl. 175-9.000.

Regan, Barrie F.; and Regan, Glen B. Denture cleaning composition containing phosphoric acid. 3,899,437, Cl. 252-106.000.

Regan, Glen B.: *See—*
Regan, Barrie F.; and Regan, Glen B., 3,899,437.

Regie Nationale des Usines Renault: *See—*
Godart, Jean; and Faure, Guy, 3,898,726.
Vidberg, Marcel, 3,898,973.

Regulla, Dieter, to Gesellschaft fur Strahlen-und Umweltforschung mbH. Manganese activated phosphate glass for dosimetry. 3,899,679, Cl. 250-484.000.

Reichel, Lee E.: *See—*
Briggs, Eugene C.; and Reichel, Lee E., 3,899,263.

Reijonen, Olavi; and Kostiainen, Lauri, to MKT-Techtaat OY. Apparatus for removing cheeses from cheese moulds. 3,899,086, Cl. 214-1.00Q.

Reimann, Paul Eldren. Outdoor cooking apparatus. 3,898,980, Cl. 126-274.000.

Reinhart, Douglass M., to Schick Incorporated. Nest for a caddy. 3,899,072, Cl. 206-45.190.

Rembaum, Alan; and Yen, Shiao-Ping S., to California Institute of Technology. Cross-linked polyelectrolytes. 3,899,534, Cl. 260-567.60P.

Remshardt, Rolf: *See—*
Feicht, Erwin; Haug, Werner Otto; Remshardt, Rolf; and Schettler, Helmut, 3,899,777.

Reneer, George R., to Star Engraving Company. Ring with sealed mounting containing mirror surface. 3,898,869, Cl. 63-15.000.

Renfrew, Edgar E.; and Botros, Raouf, to American Aniline Products, Inc. 6-Arylthio-1, 4,5-trihydroxyanthraquinones. 3,899,519, Cl. 260-383.000.

Renner, Eckhart; and Linnenbecker, Udo, to Vereinigte Flugtechnische Werke-Fokker GmbH. Supervision of several electro-hydraulic actuators operating on a common output. 3,898,916, Cl. 91-411.00R.

Republic of France: *See—*
Mercier, Jacques; and Lancon, Bernard, 3,898,934.

Republic Steel Corporation: *See—*
Waid, George M.; and Ault, Robert T., 3,899,368.

Resources Conservation Co.: *See—*
Emanuel, Carl F., 3,899,419.

Reuchlein, Gunter: *See—*
Kanzler, Hans-Joachim; and Reuchlein, Gunter, 3,898,841.

Rexnord Inc.: *See—*
Norlie, Bruce; and Bradbury, Bernard G., 3,898,935.

Reymore, Harold E., Jr.; and Zane, John K., to Upjohn Company, The. Novel cocatalyst system for trimerizing polyisocyanates. 3,899,443, Cl. 252-431.00C.

Rheinstahl AG: *See—*
Wild, Max; Schneider, Wolf-Dieter; Sennlaub, Friedel; and Winter, Rudolf, 3,899,183.

Rhodes, Timothy L.; and Wagner, John L. Building game. 3,899,169, Cl. 273-1.00R.

Rhodes, William H.: *See—*
Sellers, David J.; Rhodes, William H.; and Vasilos, Thomas, 3,899,560.

Rhone-Poulenc, S.A.: *See—*
Steffen, Joseph, 3,899,626.

Rhone-Progil: *See—*
Lanet, Jean-Claude, 3,899,532.

Rice, Richard B.: *See—*
Brandt, Randy; and Rice, Richard B., 3,899,741.

Richards, Hugh C., to Pfizer Inc. Hexahydro pyrazinoquinolines. 3,899,490, Cl. 260-268.0TR.

Richardson, Russell F., to Textron Inc. Air-hydraulic rivet gun. 3,898,833, Cl. 72-391.000.

Richelmann, Bernd H.: *See—*
Chaparro, John J.; Ellis, Lowell V.; Meanor, Doyle W.; Morton, William D., Jr.; Richelmann, Bernd H.; Ross, George B.; and Toth, John E., 3,899,085.

Richmond, William, to National Research Development Corporation. Cholesterol oxidase and method of extracting from nocardia. 3,899,376, Cl. 195-62.000.

Richter Gedeon Vegyeszeti Gyar R.T.: *See—*
Jovanovics, Karolina; Szasz, Kalman; Fekete, Gyorgy; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 3,899,493.

Richter, John W.: *See—*
Hoehn, Harvey Herbert; and Richter, John W., 3,899,309.

Ricoh Co., Ltd.: *See—*
Masumura, Masao, 3,898,957.

Rideout, Vincent L.: *See—*
Dennard, Robert H.; Rideout, Vincent L.; and Walker, Edward J., 3,899,363.

Riemenschneider, Wilhelm, to Hoechst Aktiengesellschaft. Process for the manufacture of maleic acid imide. 3,899,509, Cl. 260-326.5FM.

Rigaud, Raymond L., to Tiros Plastics Corporation. Container for packaging an object. 3,899,100, Cl. 220-229.000.

Riggs, Dean D.: *See—*
Aber, Henry S.; Riggs, Dean D.; and Lamantia, John, 3,899,410.

Rikagaku Kenkyusho Ajinomoto Co. Ltd.: *See—*
Misato, Tomomasa; Huang, Keng Tang; Homma, Yasuo; Yoshida, Ryonosuke; Saito, Tadaomi; and Shimizu, Akira, 3,899,585.

Riken Light Metal Industries Co., Ltd.: *See—*
Takahashi, Toshiro; Nagano, Toshihiro; Aoshima, Yasuo; Suzuki, Matsuo; Suzuki, Shozo; and Asahina, Teruo, 3,899,370.

Rinaldi, Rose V.; and Wynn, James E., to United States of America, Army. Electrodes including mixed transition metal oxides. 3,899,357, Cl. 136-121.000.

Ring, Russell K.: *See—*
Ring, Sandiford; and Ring, Russell K., 3,898,731.

Ring, Sandiford; and Ring, Russell K. Method of making electrical connectors. 3,898,731, Cl. 29-629.000.

Rittmannsberger, Norbert: *See—*
Werner, Peter; Drews, Ulrich; Rittmannsberger, Norbert; Busse, Wolfgang; Moder, Helmut; and Ohr, Karl-Heinz, 3,898,964.

Rivalland, Louis France; and McGarry, Aubrey Richard, to Utility Products (Proprietary) Limited. Method of forming a recess in a fastening element head. 3,898,706, Cl. 10-10.00R.

Rizzo, Earl, to Cosmo, Inc. Model aircraft. 3,898,763, Cl. 46-79.000.

Robecchi, Edoardo; and Tavazza, Giuseppe, to Industrie Pirelli S.p.A. Pneumatic tire. 3,899,014, Cl. 152-353.00C.

Robert Bosch G.m.b.H.: *See—*
Haubner, Georg, 3,898,972.
Honig, Gunther; and Kiencke, Uwe, 3,898,962.
Werner, Peter; Drews, Ulrich; Rittmannsberger, Norbert; Busse, Wolfgang; Moder, Helmut; and Ohr, Karl-Heinz, 3,898,964.

Roberts, Donald L., to NCR Corporation. Means employing a multiple lens array for reading from a high density optical memory storage. 3,899,778, Cl. 340-173.0LM.

Roblin Hope's Industries, Inc.: *See—*
Sauer, Gale E.; and Christel, Conrad, 3,898,784.

Roccaforte, Harry I., to Hoerner Waldorf Corporation. Snack tray carton. 3,899,119, Cl. 229-29.00F.

Rockwell International Corporation: *See—*
Budzyna, Edward S., 3,899,008.
Caswell, Robert L., 3,899,692.
Iverson, Marlowe L., 3,899,404.
Iverson, Marlowe L.; and McCoy, Lowell R., 3,899,405.
Molina, Orlando G., 3,899,450.
Yosim, Samuel J.; and Grantham, LeRoy F., 3,899,322.

Rodman, John J. Putting practice gage. 3,899,180, Cl. 273-183.00R.

Roeloffzen, Johannes Franciscus, to Spectrum N.V. Camouflage netting. 3,899,620, Cl. 428-112.000.

Rohowetz, Stanley Edward, to American Can Company. Method for making a lap side seam on a metal tubular boby. 3,898,945, Cl. 113-120.00A.

Rohowsky, Bohdan: *See—*
Geisel, Anthony; and Rohowsky, Bohdan, 3,899,045.

Rolfe, Nicholas: *See—*
Birchall, James Derek; Cassidy, John Edward; Rolfe, Nicholas; and Miles, Clifford Granville, 3,899,342.

Rolls-Royce Limited: *See—*
Hill, Roland John; and Jewell, Norman Thomas, 3,899,749.
Wood, Robert David, 3,898,797.

Ronson Products Limited: *See—*
Christmas, Ronald Jack, 3,899,285.

Roodvoets, Mark R., to Firestone Tire and Rubber Company, The. Antioxidants for ultraviolet curable high vinyl polybutadienes. 3,899,406, Cl. 204-159.200.

Rosenthal, Rudolph; and Kieras, Joseph A., to Atlantic Richfield Company. Cyclic process for the production of hydrogen peroxide. 3,899,576, Cl. 423-586.000.

Rosette, Alan S.; and Tepper, Barry J., to Armarco Marketing Company Inc. Adhesive binding apparatus. 3,898,955, Cl. 118-603.000.

Ross, George B.: *See—*
Chaparro, John J.; Ellis, Lowell V.; Meanor, Doyle W.; Morton, William D., Jr.; Richelmann, Bernd H.; Ross, George B.; and Toth, John E., 3,899,085.

Roth, Christian: *See—*
Muhlhausser, Martin; and Roth, Christian, 3,899,723.

Roth, Shirley H., to Cities Service Company. Novel interpolymer of amine, aldehyde and sulfanilamide. 3,899,468, Cl. 260-67.60R.

Roth, Shirley H.: *See—*
Stoy, William S.; and Roth, Shirley H., 3,899,546.

Rothert, Kenneth; Dexter, Donald D.; and Hartmann, Lester M., to Chevron Research Company. All-purpose lubricating oil composition with anti-chatter characteristics for wet disc brakes. 3,899,432, Cl. 252-32.70E.

Rothgordt, Ulf, to U.S. Philips Corporation. Facsimile transmitting receiving system with fibres having a conductive coating. 3,899,035, Cl. 178-6.60A.

Rothman, Edward S.; Hecht, Stephen S.; and Moore, Gordon G., to United States of America, Agriculture. Fabric waterproofing process. 3,899,290, Cl. 8-120.000.

Rousseau, Paul E., to Sadacem Societe Anonyme. Joining of tubular sections. 3,898,728, Cl. 29-446.000.

Rowe, Frederick; Norton, Michael George; and Fairweather, John Anthony, to Imperial Chemical Industries Limited. Aromatics extraction process. 3,899,412, Cl. 208-92.000.

Rowe, Ian George: *See—*
Connelly, Thomas Macfarlane; Rowe, Ian George; and Morrison, Douglas Stewart, 3,899,427.

Royce, Robert E. Vehicle-mounted seat belt assembly. 3,899,191, Cl. 280-150.0SB.

Rudder, Robert C., Jr. Front mounted vehicle hitch. 3,899,195, Cl. 280-481.000.

Rue, Larry M.: *See—*
Freis, Richard E.; and Rue, Larry M., 3,899,387.

Russell, Michael Frederick, to C.A.V. Limited. Transducers. 3,898,885, Cl. 73-398.0AR.

Rutenberg, Morton W.; Tessler, Martin M.; and Kruger, Leo, to National Starch and Chemical Corporation. Inhibited starch products containing labile and non-labile cross-links. 3,899,602, Cl. 426-578.000.

Ruthel, Walter W.: *See—*
Evans, Leo G.; and Ruthel, Walter W., 3,899,408.

Ryser, Kurt, to Greiner Electronic AG. Apparatus for controlling and monitoring the operation of a load device. 3,899,785, Cl. 340-309.100.

S.S.S. Patents Limited: *See—*
Clements, Herbert Arthur, 3,899,060.

Sadacem Societe Anonyme: *See—*
Rousseau, Paul E., 3,898,728.

Saito, Tadaomi: *See—*
Misato, Tomomasa; Huang, Keng Tang; Homma, Yasuo; Yoshida, Ryonosuke; Saito, Tadaomi; and Shimizu, Akira, 3,899,585.

Sakaguchi, Takehiko, to Hioki Electric Works Co., Ltd. Vibration-resistant device for taut band suspension type indicating instrument. 3,899,736, Cl. 324-154.00R.

Sakai, Kiyoshi: *See—*
Oda, Osamu; Sakai, Kiyoshi; Yusa, Takashi; and Katano, Hamako, 3,899,525.

Sakal, John: *See—*
O'Brien, William J.; and Sakal, John, 3,899,381.

Sakamoto, Yuzo: *See—*
Maeda, Teruo; Shimoe, Hideo; Fujiwara, Yasuhiko; Aya, Norimoto; Marumo, Nagayuki; Tsuji, Heigo; and Sakamoto, Yuzo, 3,899,047.

Salmon, Warren Allen: *See—*
Chandross, Edwin Arthur; Pryde, Coralie Anne; and Salmon, Warren Allen, 3,899,678.

Salve S.A.: *See—*
Spiegelberg, Hans, 3,899,077.

Samhammer, Clair A.; and Lederman, Steven N., to Lederman's Incorporated. Bean-bag chair. 3,899,210, Cl. 297-445.000.

Samson, Marvin S.; and Pfleger, Frederick W. Volume control system for liquid packaging apparatus. 3,899,010, Cl. 141-250.000.

Sanders Associates, Inc.: *See—*
Hayner, Paul F., 3,899,002.

Sandoz, Inc.: *See—*
Hardtmann, Goetz E., 3,899,507.

Sandoz Ltd.: *See—*
Fleck, Fritz; Mercer, Alec Victor; Paver, Roger; and Schmid, Horst, 3,899,487.
Ott, Hans; and Suess, Rudolf, 3,899,494.

Sankyo Co., Ltd.: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 3,899,464.
Oda, Osamu; Sakai, Kiyoshi; Yusa, Takashi; and Katano, Hamako, 3,899,525.

Santos, Anthony J., to Amerace Corporation. Electrical connector. 3,899,236, Cl. 339-98.000.

Sanyo Electric Company, Ltd.: *See—*
Yamauchi, Seizo; and Shimomura, Kazuo, 3,899,773.

Saraga, Peter; and Wavish, Peter Roy, to U.S. Philips Corporation. Method of character recognition by linear traverse employing shifted edge lines. 3,899,771, Cl. 340-146.3AE.

Sargent Industries, Inc.: *See—*
Press, Robert J., 3,898,806.
Smith, Fred T., 3,899,091.

Sasaki, Rentaro; Watanabe, Akinori; Ikegame, Mamoru; and Ogasawara, Tatsuo, to Oki Electric Industry Co., Ltd.; and Okaya Electric Industry Co., Ltd. Cold cathode discharge type display device. 3,899,707, Cl. 313-197.000.

Sasaki, Shigeru: *See—*
Masai, Tadahisa; Adachi, Tetsuro; Sasaki, Shigeru; and Moriyama, Kazuyoshi, 3,899,266.

Sasaki, Yoshio; and Morita, Minoru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recombustion assembly for an internal combustion engine. 3,898,803, Cl. 60-305.000.

Sather, Kenneth E. Stay clean funnel. 3,899,012, Cl. 141-331.000.

Sato, Akira: *See—*
Nakamura, Kenya; and Sato, Akira, 3,898,793.

Sato, Kuniaki: *See—*
Murata, Yuuji; Sato, Kuniaki; and Yonejima, Sigeru, 3,898,927.

Sato, Yoshinori: *See—*
Miyake, Toshio; and Sato, Yoshinori, 3,899,604.

Satomi, Takeo: *See—*
Tanaka, Shizuya; Ozaki, Toshiaki; Mine, Akihiko; Tanaka, Katsutoshi; Yamamoto, Sigeo; Ooishi, Tadashi; Hino, Naganori; and Satomi, Takeo, 3,899,582.

Sauer, Gale E.; and Christel, Conrad, to Roblin Hope's Industries, Inc. Beam splice connection. 3,898,784, Cl. 52-758.00A.

Savage, Donald D. Log separation system. 3,898,901, Cl. 83-343.000.

Savage, Jack Mark Charles, to Burger Boy Red Top Refreshment Kiosks Limited. Deodorisation unit. 3,898,922, Cl. 98-115.00R.

Savary, Wolf; and Soennecken, Hartmut, to Textar GmbH. Lining for brake shoes. 3,899,050, Cl. 188-73.100.

Sawamoto, Youzi: *See—*
Miya, Bunji; Kasutani, Katsuji; Matsuda, Morio; Hashimoto, Akio; Nisigawa, Shiyozo; and Sawamoto, Youzi, 3,899,446.

Sawluk, Wlodzimierz, to Ernst Winter & Sohn. Material removal tool with multiple cutting edges. 3,898,772, Cl. 51-206.00P.

Sbarra, Joseph F.: *See—*
Fead, William A.; Glynn, Thomas M.; Sbarra, Joseph F.; and Bower, Alfred L., 3,899,278.

Scanzani, Robert M.: *See—*
Georgiev, Tancho D.; and Scanzani, Robert M., 3,898,777.

Schaap, Johannes Emmus, to Stichting Bedrijven van het Nederlands Instituut voor Zuivelonderzoek. Process of preparing a fat emulsion. 3,899,605, Cl. 426-582.000.

Schaefer, Hans: *See—*
Beschke, Helmut; Schaefer, Hans; and Schuler, Wilhelm Alfons, 3,899,495.

Schafe, Ulrich, to Siemens Aktiengesellschaft. Method and arrangement for limiting the power dissipated in electronic components. 3,899,718, Cl. 317-33.00R.
Schalm, Wolfgang, to Schuco Heinz Schurmann & Co. Mortise lock. 3,898,822, Cl. 70-143.000.
Scharwaechter, Peter: *See*—
Petersen, Harro; Fuchs, Friedrich; and Scharwaechter, Peter, 3,899,548.
Petersen, Harro; Fuchs, Friedrich; and Scharwaechter, Peter, 3,899,549.
Schaumann, Rolf: *See*—
Cadez, August; and Schaumann, Rolf, 3,899,722.
Schettler, Helmut: *See*—
Feicht, Erwin; Haug, Werner Otto; Remshardt, Rolf; and Schettler, Helmut, 3,899,777.
Schick Incorporated: *See*—
Reinhart, Douglass M., 3,899,072.
Schindler, Donald G.: *See*—
Bowman, Howard J.; and Schindler, Donald G., 3,899,651.
Schindler, Norbert; and Ploger, Walter, to Henkel & Cie GmbH. Production of 1-aminoalkane-1,1-diphosphonic acids. 3,899,496, Cl. 260-293.510.
Schlanzky, Manfred P. H., to General Motors Corporation. Differential mounted single stage diaphragm operated pump. 3,898,892, Cl. 74-710.000.
Schmermund, Alfred. Web cutting device. 3,898,900, Cl. 83-152.000.
Schmid, Horst: *See*—
Fleck, Fritz; Mercer, Alec Victor; Paver, Roger; and Schmid, Horst, 3,899,487.
Schmidt, Gerhard, to Franz Morat GmbH, Firma. Pattern means for circular knitting machines and method for operating same. 3,898,818, Cl. 66-50.00B.
Schmidt, Hans-Joachim: *See*—
Fernholz, Hans; Wunder, Friedrich; and Schmidt, Hans-Joachim, 3,899,539.
Schmitt, Otto: *See*—
Gebert, Karl; and Schmitt, Otto, 3,899,015.
Schneider, William H. Bed drainage tube holder. 3,899,149, Cl. 248-75.000.
Schneider, William P., to Upjohn Company, The. Extract containing prostaglandins. 3,899,526, Cl. 260-468.00D.
Schneider, Wolf-Dieter: *See*—
Wild, Max; Schneider, Wolf-Dieter; Sennlaub, Friedel; and Winter, Rudolf, 3,899,183.
Scholl, Hans-Joachim; Klauke, Erich; Grewe, Ferdinand; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. 4,5-Bis-(trifluoromethylimino)-thiazolidines as fungicidal, insecticidal and acaricidal agents. 3,899,584, Cl. 424-270.000.
Scholz, Manfred: *See*—
Dorner, Heinrich; Scholz, Manfred; and Jungmann, Axel, 3,899,393.
Schonowsky, Hubert: *See*—
Horlein, Gerhard; Langeluddeke, Peter; Schonowsky, Hubert; and Studeneer, Adolf, 3,899,489.
Schreiber, Victor M. Storage units. 3,899,228, Cl. 312-257.00R.
Schreier, Wilford Rayburn, to Hammond Corporation. Monophonic electronic musical instrument. 3,898,905, Cl. 84-1.010.
Schroder, Heinz-Jurgen: *See*—
Mayer, Hans; and Schroder, Heinz-Jurgen, 3,898,961.
Schuchardt, Peter W.: *See*—
Schultz, Thomas E.; and Schuchardt, Peter W., 3,899,383.
Schuco Heinz Schurmann & Co.: *See*—
Schalm, Wolfgang, 3,898,822.
Schuessler, Philipp W. H.: *See*—
Peters, Henry G., Jr.; and Schuessler, Philipp W. H., 3,899,339.
Schuler, Manfred, to Pittman Products, Inc. Convertible inflation control for underwater diving vests. 3,898,705, Cl. 9-313.000.
Schuler, Wilhelm Alfons: *See*—
Beschke, Helmut; Schaefer, Hans; and Schuler, Wilhelm Alfons, 3,899,495.
Schull, Leona Louise: *See*—
Maurer, Dean William; and Schull, Leona Louise, 3,899,351.
Schuller, Fredrick T.; and Moore, Warren A., to United States of America, General Counsel-Code GP. Lubricated journal bearing. 3,899,224, Cl. 308-121.000.
Schultz, Robert F.; and Cook, Edward H., Jr., to Hooker Chemicals & Plastics Corporation. Bipolar electrode. 3,899,409, Cl. 204-290.00F.
Schultz, Thomas E.; and Schuchardt, Peter W., to Minnesota Mining and Manufacturing Company. Strip applying device. 3,899,383, Cl. 156-394.000.
Schulz, Richard H. Adjustable motorcycle backrest. 3,899,209, Cl. 297-383.000.
Schumacher, Paul M.: *See*—
Peterkofsky, Alan L.; Tracy, James E.; and Schumacher, Paul M., 3,899,457.
Peterkofsky, Alan L.; Tracy, James E.; and Schumacher, Paul M., 3,899,458.
Schutz, Hans Ulrich: *See*—
Buhler, Arthur; Schutz, Hans Ulrich; Mausezahl, Dieter; Harris, Melvin; and Guth, Christian, 3,899,469.
Schwartz, Gunther; and Frank, Klaus, to Hoechst Aktiengesellschaft. Sorting device separating a powder mixture into spheroidal and sharp-edged particles. 3,899,416, Cl. 209-118.000.
Schwartz, Hermann, to Peyer, Siegfried. Releasable paper clip. 3,898,717, Cl. 24-259.000.
Schwartz, Joseph M.: *See*—
Marcus, Douglas Larry, 3,898,978.
Schwarz, Hans Georg, to Didier-Werke AG. Refractory fired shaped element and process of its manufacture. 3,899,341, Cl. 106-57.000.
Schwarz, Hans Helmut: *See*—
Immel, Otto; and Schwarz, Hans Helmut, 3,899,485.
Schwarz, Wilhelm, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Buffer. 3,899,160, Cl. 267-152.000.
Schwarzova, Libuse: *See*—
Paukert, Miloslav; and Schwarzova, Libuse, 3,899,242.
Schweizer, Gottfried; and Smolka, Thomas Gordon, to Gertsch AG. Ski boot having internal binding components. 3,899,190, Cl. 280-11.35R.
Schwelberger, Hubert: *See*—
Sigott, Siegfried; and Schwelberger, Hubert, 3,899,212.
SCM Corporation: *See*—
Corbett, Paul M., 3,899,324.
Hall, Roger P., 3,899,611.
Scott, Robert N.: *See*—
Sieckhaus, John F.; Scott, Robert N.; and Larchar, Trescott B., 3,899,456.
Scovill Manufacturing Company: *See*—
Gamble, Kenneth H., 3,899,200.
Scripto, Inc.: *See*—
Lockwood, John C.; and Vaughan, Harry L., 3,899,286.
Seaberg, David H., to J. I. Case Company. Control linkage for dual path hydraulic drive. 3,898,811, Cl. 60-421.000.
Segain, John E.: *See*—
Esser, Karl; Friedrich, Robert; and Segain, John E., 3,899,327.
Seidl, Anton, to Vickers-Zimmer Aktiengesellschaft. Process for the production of mixed yarns. 3,899,562, Cl. 264-210.00F.
Seidle, Norman R., to Singer Company, The. Driver trainer system. 3,898,746, Cl. 35-11.000.
Seiter, George M., to Hoerner Waldorf Corporation. Easy opening dispenser for barrier carton or container. 3,899,079, Cl. 206-498.000.
Sekiguchi, Koichi: *See*—
Iwata, Hiroyoshi; Sekiguchi, Koichi; and Ishikawa, Yoshikazu, 3,898,963.
Sekimoto, Yasuhiro; and Miura, Yoshitada, to Hitachi Metals, Ltd. Metal casting mold for centrifugal casting machine. 3,899,020, Cl. 164-286.000.
Sellers, David J.; Rhodes, William H.; and Vasilos, Thomas, to Avco Corporation. Method of preparing transparent alumina. 3,899,560, Cl. 264-65.000.
Sells, Bertram C. Automobile racing board game apparatus. 3,899,177, Cl. 273-134.0AD.
Semperit Aktiengesellschaft: *See*—
Friedl, Franz, 3,899,153.
Senior, Norman: *See*—
Bird, Margaret Ellen; and Senior, Norman, 3,899,578.
Sennlaub, Friedel: *See*—
Wild, Max; Schneider, Wolf-Dieter; Sennlaub, Friedel; and Winter, Rudolf, 3,899,183.
Seyferth, Dietmar; and Lambert, Robert L., Jr., to Massachusetts Institute of Technology. Silacyclopropanes and method. 3,899,523, Cl. 260-448.20D.
Shade, Ray W.: *See*—
Sliva, Daniel E.; Krutchen, Charles M.; and Shade, Ray W., 3,899,574.
Shah, Tilak M.: *See*—
Bonk, Henry W.; and Shah, Tilak M., 3,899,467.
Shannahan, Robert Thomas: *See*—
Waxman, Burton Harvey; Shannahan, Robert Thomas; and Viro, Felix, 3,899,330.
Sharp Kabushiki Kaisha: *See*—
Nakai, Siyunzi; and Nakarai, Masazumi, 3,899,659.
Shaw, Henry; and Angier, Derek J., to Exxon Research and Engineering Company. Production of fine powders. 3,899,573, Cl. 423-337.000.
Shellhause, Ronald L., to General Motors Corporation. Hydraulic brake booster assembly. 3,898,914, Cl. 91-375.00R.
Shen, Tsung-Ying; Dorn, Conrad P., Jr.; and Li, Jorge P., to Merck & Co., Inc. 4-(Benzoxazol-2-yl)-phenylacetic acids and derivatives thereof. 3,899,506, Cl. 260-307.00D.
Sheneman, Jack M.: *See*—
Suarez, Tulio; Kornfeld, Edmund C.; and Sheneman, Jack M., 3,899,592.
Shenker, Martin. Cleaning device for photo-slides. 3,899,137, Cl. 239-545.000.
Shepherd, Glen C.; Allen, James B.; and Bryant, Samuel T., to Texas Instruments Incorporated. Automatic defrosting control system. 3,898,860, Cl. 62-155.000.
Shigemori, Hideto; Ueba, Akio; and Kitagami, Hisashi, to Glory Kogyo Kabushiki Kaisha. Money container setting circuit in an automatic money dispenser. 3,899,103, Cl. 221-10.000.
Shikishima Tipton Mfg. Co., Ltd.: *See*—
Kobayashi, Hisamine, 3,898,767.
Shimada, Katsunori: *See*—
United States of America, National Aeronautics and Space Administration; and Shimada, Katsunori, 3,899,696.
Shimizu, Akira: *See*—
Misato, Tomomasa; Huang, Keng Tang; Homma, Yasuo; Yoshida, Ryonosuke; Saito, Tadaomi; and Shimizu, Akira, 3,899,585.
Shimizu, Mahito: *See*—
Shirahata, Ryuji; Kitamoto, Tatsuji; Shimizu, Mahito; and Suzuki, Masaaki, 3,898,952.

Shimoe, Hideo: *See—*
Maeda, Teruo; Shimoe, Hideo; Fujiwara, Yasuhiko; Aya, Norimoto; Marumo, Nagayuki; Tsuji, Heigo; and Sakamoto, Yuzo, 3,899,047.

Shimomura, Kazuo: *See—*
Yamauchi, Seizo; and Shimomura, Kazuo, 3,899,773.

Shirahata, Ryuji; Kitamoto, Tatsuji; Shimizu, Mahito; and Suzuki, Masaaki, to Fuji Photo Film Co., Ltd. Apparatus for production of magnetic recording medium. 3,898,952, Cl. 118-49.100.

Shirai, Kikuo: *See—*
Ezoe, Takuji; and Shirai, Kikuo, 3,898,852.

Shiraishi, Masatake: *See—*
Komiyama, Shigeo; Matsubara, Ichiro; and Shiraishi, Masatake, 3,899,386.

Shotbolt, Keith; Eastwood, Alan; and Gait, John Henry, to W. R. Gwace & Co. Closure sorting method and apparatus. 3,899,081, Cl. 209-73.000.

Shreve, Russell L. Brake actuating mechanism. 3,899,055, Cl. 188-344.000.

Shugart Associates: *See—*
Chou, Albert S.; Tong, Yang Hu; Medley, Harold C.; and Dalziel, Warren L., 3,898,814.

Shure, Lloyd I.: *See—*
Burns, Raymond K.; Shure, Lloyd I.; and Katzen, Elliott D., 3,899,680.

Shuster, Edward J.: *See—*
Mookherjee, Braja Dulal; Vock, Manfred Hugo; Benaim, Carlos; and Shuster, Edward J., 3,899,597.

Sicko, John S.; Hodsoll, Raymond J., Jr.; and Adamchick, John T., to General Electric Company. Programmable terminal. 3,899,776, Cl. 340-172.500.

Sieckhaus, John F.; Scott, Robert N.; and Larchar, Trescott B., to Olin Corporation. Siloxane vulcanizates and a method for the preparation thereof. 3,899,456, Cl. 260-18.00S.

Siegemund, Gunter, to Hoechst Aktiengesellschaft. Process for the preparation of fluorine containing carbonyl dihalides. 3,899,531, Cl. 260-544.00F.

Siegmund, Walter P., to American Optical Corporation. Lens manufacturing process. 3,899,314, Cl. 65-23.000.

Siegmund, Walter P., to American Optical Corporation. Method of making glass clad glass lenses. 3,899,315, Cl. 65-23.000.

Siemens Aktiengesellschaft: *See—*
Bodlaj, Viktor, 3,899,748.
Dietze, Wolfgang, 3,899,557.
Dorner, Heinrich; Scholz, Manfred; and Jungmann, Axel, 3,899,393.
Gammel, Josef Engelbert, 3,899,746.
Grabmaier, Josef; and Plaettner, Rolf, 3,899,313.
Greubel, Waldemar; Krueger, Hans; and Wolff, Ulrich, 3,899,786.
Klein, Klaus-Wilhelm; and Rau, Peter, 3,899,390.
Kleinschmidt, Peter, 3,899,698.
Leistner, Werner, 3,899,704.
Mayer, Hans; and Schroder, Heinz-Jurgen, 3,898,961.
Schafe, Ulrich, 3,899,718.

Sig Schweizerische Industrie-Gesellschaft: *See—*
Heinzer, Hans, 3,899,069.

Sigel, Pierre Louis; and Grosjean, Henri, to Compagnie Honeywell Bull. Contact head for electrically monitoring a plurality of points in a circuit. 3,899,233, Cl. 339-59.00M.

Sigott, Siegfried; and Schwelberger, Hubert, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Dividing cutting machine having means for rotating the jib arm. 3,899,212, Cl. 299-75.000.

Sigworth, Frederick J.: *See—*
Morris, Harold D.; and Sigworth, Frederick J., 3,899,028.

Siletto, Giorgio: *See—*
Ravera, Giovanni; and Siletto, Giorgio, 3,899,792.

Simjian, Luther G. Exercise and massaging apparatus. 3,899,115, Cl. 128-58.000.

Simmons, John Richard; and Hammond, Trevor John, to Joseph Lucas (Industries) Limited. Screw-type actuators. 3,898,890, Cl. 74-89.150.

Simms Group Research & Development Ltd.: *See—*
Barker, Barrie Gilbert, 3,898,795.

Simone, Joseph D., to Raytheon Company. Serial three point discrete fourier transform apparatus. 3,899,667, Cl. 235-156.000.

Simonelli, Frank A. Fungistatic fabric treatment. 3,899,616, Cl. 427-242.000.

Singer Company, The: *See—*
Hanna, Samuel C.; and Krupick, Walter J., 3,899,702.
Seidle, Norman R., 3,898,746.

Singer, Edouard. Voltage detector for detecting AC voltages. 3,899,735, Cl. 324-122.000.

Singer, Paul: *See—*
Mandel, Louis; Ong, Algernon M.; and Singer, Paul, 3,898,984.

Sitek, George J.; and Berk, Charles W., to Leco Corporation. Crucible. 3,899,627, Cl. 13-22.000.

Sivyer, Raymond Frank: *See—*
Brown, Patrick Harold; and Sivyer, Raymond Frank, 3,899,709.

Skaling, Percy E.; and Skaling, Whitney, to Soilmoisture Equipment Corporation. Tensiometer for soil moisture measurement. 3,898,872, Cl. 73-73.000.

Skaling, Whitney: *See—*
Skaling, Percy E.; and Skaling, Whitney, 3,898,872.

SKF Industrial Trading and Development B.V.: *See—*
Jauhiainen, Toivo Untamo, 3,898,897.

Skinner, Charles Arthur, to Electro-Therm, Inc. Oven, heating element and socket assembly. 3,899,655, Cl. 219-404.000.

Skov, Ebbe R.; Judge, Roderick B.; and Hemphill, Geoffrey, to W. R. Grace & Co. Rot and mildew prevention employing certain alkanoic acid salts. 3,899,588, Cl. 424-317.000.

Slezak, Raymond J. Tension control device. 3,899,143, Cl. 242-156.200.

Sliva, Daniel E.; Krutchen, Charles M.; and Shade, Ray W., to General Electric Company. Method for making graphite fiber and ribbon. 3,899,574, Cl. 423-447.000.

Slotkowski, Kenneth G., to Ford Motor Company. Multiple input warning system for a motor vehicle. 3,899,770, Cl. 340-52.00F.

Smith, Charles L.: *See—*
Minnick, Leonard John; Webster, William C.; and Smith, Charles L., 3,899,345.

Smith, Forest D., to Electric Machinery Mfg. Company. Voltage regulator with controlled current. 3,899,731, Cl. 322-25.000.

Smith, Fred T., to Sargent Industries, Inc. Refuse collection apparatus. 3,899,091, Cl. 214-83.300.

Smith, Gary C., Jr.: *See—*
Adams, Cecil E.; Born, Ellis H.; and Smith, Gary C., Jr., 3,898,917.

Smith, Richard A.: *See—*
Zientara, Donald; and Smith, Richard A., 3,898,699.

Smith, Roy R., to General Motors Corporation. Self-cleaning oven with temperature limiting protection system for bake and clean. 3,899,656, Cl. 219-413.000.

Smolka, Thomas Gordon: *See—*
Schweizer, Gottfried; and Smolka, Thomas Gordon, 3,899,190.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Piacente, Luigi; and Capannini, Sanzio, 3,899,640.

Societe Anonyme Automobiles Citroen: *See—*
Grosseau, Albert, 3,899,051.

Societe Anonyme D.B.A.: *See—*
Carre, Jean-Jacques, 3,899,057.

Societe Anonyme dite: Orsymonde: *See—*
Souchard, Maddy, 3,899,533.

Societe Civile Textile dite Socitex: *See—*
Gleyze, Jean, 3,899,140.

Societe d'Etude et d'Application des Techniques Nouvelles NEO-TEC: *See—*
Honore, Etienne Augustin Henri; Torcheux, Emile Leon Gabriel, deceased; Torcheux, Micheline Marie, born Deloffre, heir; Torcheux, Alain, heir; and Geret, Adeline, born Torcheux, heir, 3,899,769.

Societe Generale de Constructions Electriques et Mecaniques Alsthom & Cie: *See—*
Groult, Pierre; Hubert, Francois; Daunay, Jacques; and Bono, Pierre, 3,899,356.

Societe Nationale des Poudres et Explosifs: *See—*
Girardon, Hubert; and Emeury, Jean Marie, 3,899,536.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation de France: *See—*
Camboulives, Andre Alphonse Mederic Leon; Le Maout, Theophile Francois; and Zibette, Bernard Arthur, 3,899,133.

Soennecken, Hartmut: *See—*
Savary, Wolf; and Soennecken, Hartmut, 3,899,050.

Soilmoisture Equipment Corporation: *See—*
Skaling, Percy E.; and Skaling, Whitney, 3,898,872.

Sokolow, Nickolas, to Beloit Corporation. Annular extrusion die with back pressure control. 3,899,276, Cl. 425-380.000.

Soler, Salvador Forroll, to Establissements du Paroy. Method for chemically peeling fruits and vegetables. 3,899,608, Cl. 426-287.000.

Solomon, James E.; and Zias, Arthur R., to National Semiconductor Corporation. Semiconductor pressure transducer employing novel temperature compensation means. 3,899,695, Cl. 307-310.000.

Sonic Development Corporation: *See—*
Bell, Frank S., Jr., 3,899,130.

Sonoco Products Company: *See—*
Hodges, James T., Jr.; Braddock, John B.; and Dishman, George C., 3,899,142.

Sony Corporation: *See—*
Machida, Hiromasa; and Yamaguchi, Noboru, 3,899,710.
Wakamiya, Kinji; and Kobayashi, Isamu, 3,899,793.
Watanabe, Kunitake, 3,899,795.
Watanabe, Naozo; Morizane, Kenji; and Ayabe, Masaaki, 3,899,572.

Sorenson, Keith S.; and Lewis, David E., to Columbia Pictures Industries, Inc. Subscription television system. 3,899,633, Cl. 178-5.100.

Souchard, Maddy, to Societe Anonyme dite: Orsymonde. Chlorinated mandelamidines. 3,899,533, Cl. 260-564.00G.

Southern California Gas Co.: *See—*
Hirt, John H., 3,899,628.

Spectrum N.V.: *See—*
Roeloffzen, Johannes Franciscus, 3,899,620.

Speedfam Corporation: *See—*
Benz, Ernest A.; and Keefe, James V., 3,898,770.

Speier, John L.; and LeGrow, Gary E., to Dow Corning Corporation. Methyl-5-(trimethoxy silyl propylthio) norbornane-2,3-dicarboxylic anhydride. 3,899,515, Cl. 260-346.300.

Spencer, Harvey G. Ski tram loading system and carriers therefor. 3,898,936, Cl. 104-173.000.

Sperry Rand Corporation: *See—*
Kreeger, Richard C.; and Kuitunen, Matthew O., 3,899,662.

Sperry-Sun Well Surveying Company: *See—*
McArthur, Billy W., 3,898,877.

Spicer, John William: *See—*
Warren, Brian Thomas; and Spicer, John William, 3,899,513.

Spicer, Larry Dean; and Hand, John James, to American Cyanamid Company. Method of using 6-substituted amino phenyl-2,3,5,6-tetrahydro-[2,1-B]thiazoles. 3,899,583, Cl. 424-270.000.

Spiegelberg, Hans, to Salve S.A. Strip package. 3,899,077, Cl. 206-441.000.

Spinnato, Gaetano Emanuele, to Oraltechnic Anstalt. Electrical resistance weld method and apparatus. 3,899,653, Cl. 219-113.000.

Srinivasan, Sundaresa: *See—*
Chen, Nai Yuen; and Srinivasan, Sundaresa, 3,898,959.

Staby, Paul A., to Statitrol Corporation. Method and apparatus for monitoring battery energy level. 3,899,732, Cl. 324-29.500.

Stachurski, John Z. O. Thermoelectric generator. 3,899,359, Cl. 136-205.000.

Stal Refrigeration AB: *See—*
Glanvall, Rune, 3,899,271.

Stallworth, Lewis A.; and Hartley, Robert R., to United States of America, Navy. Ship speed indicator. 3,898,878, Cl. 73-181.000.

Stamberger, Paul. Method and means for increasing the air pressure within self-inflated hollow bodies for use as cushions and for like purposes. 3,898,703, Cl. 5-348.00R.

Standard Packaging Corporation: *See—*
Brunda, Michael J., 3,899,080.

Standard Register Company, The: *See—*
O'Brien, William J.; and Sakal, John, 3,899,381.

Standun, Inc.: *See—*
Tamble, George D.; and Olsen, Frederick C., 3,899,087.

Stanley Drug Products, Inc.: *See—*
Cook, Elton S.; and Tanaka, Kinji, 3,899,589.

Stanley, Robert W., to Noranda Mines Limited. Form of ammonium tetramolybdate and method of preparation. 3,899,284, Cl. 423-593.000.

Stapfer, Christian H., to Cincinnati Milacron Chemicals, Incorporated. Synergistic organotin stabilizer compositions and resins stabilized therewith. 3,899,465, Cl. 260-45.75S.

Star Engraving Company: *See—*
Reneer, George R., 3,898,869.

Stark, Sven Olof Soren; and Ljungberg, Per Allan, to Tetra Pak Developpement S.A. Apparatus for treating webs of material. 3,899,112, Cl. 226-90.000.

Starks, Charles M.; and Gordon, Ronnie D., to Continental Oil Company. Preparation of alkyl halides. 3,899,542, Cl. 260-658.00R.

Statitrol Corporation: *See—*
Staby, Paul A., 3,899,732.

Stauffer Chemical Company: *See—*
Walsh, Edward N., 3,899,453.

Steadley Company, Inc.: *See—*
Hall, Guy E., 3,899,043.

Steckler, Steven Alan; and Limberg, Allen Leroy, to RCA Corporation. Dual mode deflection synchronizing system. 3,899,635, Cl. 178-69.5TV.

Steelman, Melvin W., to Clark Equipment Company. Refrigeration evaporator coil. 3,898,864, Cl. 62-272.000.

Stefanov, Stefan Ivanov: *See—*
Alexandrov, Alexander Damyanov; Trifonov, Todor Kostov; Stefanov, Stefan Ivanov; Apostolov, Paskal Spasov; and Deshev, Mincho Borislavov, 3,899,021.

Steffen, Joseph, to Rhone-Poulenc, S.A. Composite articles based on heat-resistant resins. 3,899,626, Cl. 428-474.000.

Stenne, Pierre, to Claudel S.A. Process and apparatus for the continuous production of curds. 3,899,595, Cl. 426-36.000.

Stenne, Pierre, to Claudel S.A. Method for the manufacture of cheeses. 3,899,596, Cl. 426-40.000.

Stephens, Jerome P.: *See—*
Gallaher, William C.; Stephens, Jerome P.; Testa, Phillip J.; and Wein, James E., 3,898,704.

Stephens, Ruth E., to Ethyl Corporation. Exhaust gas catalyst support. 3,899,444, Cl. 252-455.00R.

Stephenson, Andrew N., to United States of America, Navy. Laser transmitting and receiving lens optics. 3,899,145, Cl. 244-3.130.

Stewart, Donald M.: *See—*
Osborn, Merlin L.; Crytzer, Layton D.; and Stewart, Donald M., 3,899,733.

Stewart, Richard F.; and Gasparini, Francis A., to Westinghouse Electric Corporation. Condensate disposal apparatus for an air conditioner. 3,898,865, Cl. 62-280.000.

Stichting Bedrijven van het Nederlands Instituut voor Zuivelonderzoek: *See—*
Schaap, Johannes Emmus, 3,899,605.

Stickney, William A.: *See—*
Hunter, Willard L.; White, Jack C.; and Stickney, William A., 3,899,569.

Stollberg, Ray H.; and Leaky, Joseph W., to Crown Zellerbach Corporation. Collapsible bliss-type container. 3,899,123, Cl. 229-41.00R.

Stone & Webster Engineering Corporation: *See—*
Sulzer, Hans D.; and Coletti, Joseph L., 3,899,391.

Storrin, Ronald J.: *See—*
Alaimo, Robert J.; and Storrin, Ronald J., 3,899,503.

Stover, Harris A. Communication systems. 3,899,671, Cl. 235-150.200.

Stoy, William S.; and Roth, Shirley H., to Cities Service Company. Intumescent compositions containing an amino benzenesulfonamide resin and an epoxy resin. 3,899,546, Cl. 260-834.000.

Streckfus, Thomas K.: *See—*
Hammond, John E.; and Streckfus, Thomas K., 3,899,593.

Streeter, Terry L.: *See—*
Frick, Douglas G.; Morgan, Thomas R.; and Streeter, Terry L., 3,899,568.

Structural Systems, Inc.: *See—*
Boice, G. Newton, 3,899,259.

Studders, Robert J., to Permag Magnetics Corporation. Permanent magnetic structure. 3,899,762, Cl. 335-302.000.

Studeneer, Adolf: *See—*
Horlein, Gerhard; Langeluddeke, Peter; Schonowsky, Hubert; and Studeneer, Adolf, 3,899,489.

Stumpf, Elmer J.; and Mockabee, Allan D., to Michaud, Inc. Music stethoscope. 3,899,044, Cl. 181-135.000.

Stupecky, Joseph Jaromir: *See—*
Kozak, Zdenek Vaclav; and Stupecky, Joseph Jaromir, 3,898,883.

Stupfel, Clifford L., to Rader Companies, Inc. Anti-dusting baffle for feeder. 3,899,214, Cl. 302-49.000.

Suarez, Tulio; Kornfeld, Edmund C.; and Sheneman, Jack M., to Eli Lilly and Company. Sweetening agent. 3,899,592, Cl. 426-2.000.

Sudler, Roland: *See—*
Arzi, Friedrich; Hofert, Paul; and Sudler, Roland, 3,898,789.

Suess, Rudolf: *See—*
Ott, Hans; and Suess, Rudolf, 3,899,494.

Sugier, Andre, to Institut Francais du Petrole des Carburants et Lubrifiants. Carbon monoxide conversion catalysts. 3,899,577, Cl. 423-656.000.

Sugiyama, Shunichi: *See—*
Ogawa, Takashi; Sugiyama, Shunichi; and Kida, Kiyonori, 3,899,701.

Suhay, Laszlo. Light bulb base extractor. 3,898,896, Cl. 81-72.000.

Sulzer, Hans D.; and Coletti, Joseph L., to Stone & Webster Engineering Corporation. Containment vessel construction for nuclear power reactors. 3,899,391, Cl. 176-37.000.

Sumitomo Chemical Company, Limited: *See—*
Okuno, Yoshitoshi; and Hirano, Masachika, 3,899,586.
Tanaka, Shizuya; Ozaki, Toshiaki; Mine, Akihiko; Tanaka, Katsutoshi; Yamamoto, Sigeo; Ooishi, Tadashi; Hino, Naganori; and Satomi, Takeo, 3,899,582.
Tokushige, Toshio; and Nagayasu, Motokiyo, 3,899,575.
Yamada, Koichi; Hashimoto, Tadanori; and Nakano, Kazuhiko, 3,899,571.

Sun, Kuan H.: *See—*
Goldstein, Norman P.; and Sun, Kuan H., 3,899,676.

Sun Ventures, Inc.: *See—*
Dickason, Alan F., 3,899,516.
Turner, John O.; and Deno, Norman C., 3,899,538.

Sundberg, Erik G., to Aktiebolaget Tudor. Filter cap for storage batteries. 3,899,358, Cl. 136-179.000.

Super Laundry Machinery Company, Inc.: *See—*
Behn, Sheldon P., 3,899,166.

Superior Electric Company, The: *See—*
Emery, Arthur Richard, 3,899,729.

Surgical Appliance Industries, Inc.: *See—*
Lewis, Hector E., deceased; and MacLean, June Rae, executrix, 3,898,709.

Sutherland, William M., to General Dynamics Corporation. Method for protecting surfaces against environmental damage and the resultant products. 3,899,624, Cl. 428-327.000.

Sutton, Christopher John, to Lucas Electrical Company Limited, The. Road vehicle braking system incorporating wheel slide protection. 3,899,215, Cl. 303-21.0AF.

Suzuki, Masaaki: *See—*
Shirahata, Ryuji; Kitamoto, Tatsuji; Shimizu, Mahito; and Suzuki, Masaaki, 3,898,952.

Suzuki, Matsuo: *See—*
Takahashi, Toshiro; Nagano, Toshihiro; Aoshima, Yasuo; Suzuki, Matsuo; Suzuki, Shozo; and Asahina, Teruo, 3,899,370.

Suzuki, Shozo: *See—*
Takahashi, Toshiro; Nagano, Toshihiro; Aoshima, Yasuo; Suzuki, Matsuo; Suzuki, Shozo; and Asahina, Teruo, 3,899,370.

Suzuki, Takashi; and Naito, Susumu, to Mitsubishi Gas Chemical Company, Ltd. Hydroxylation process. 3,899,540, Cl. 260-621.00G.

Suzuki, Teruaki: *See—*
Okada, Nobuhiko; and Suzuki, Teruaki, 3,899,139.

Swanbeck, Gunnar P. E.; Zetterberg, Gosta L.; and Agback, Karl Hubert, to Pharmacia Aktiebolag. Preparation for treating psoriasis. 3,899,591, Cl. 424-346.000.

Swanningson, Douglas. Fishing lure. 3,898,758, Cl. 43-42.480.

Swanson, Colin John, to ISC Alloys Limited. Forming of superplastic alloy sheet. 3,898,827, Cl. 72-60.000.

Swartz, Jerome: *See—*
Barkan, Harold; Brayman, George E.; and Swartz, Jerome, 3,899,713.

Sweco, Inc.: *See—*
Hansen, Leslie T., 3,899,414.

Swedberg, Nils Einar, to Eaton Corporation. Drive connection means for a hydraulic device. 3,899,270, Cl. 418-61.00B.

Sweet, Clyde W., to Eastman Kodak Company. Additive composition for reduced particle size meats in the curing thereof. 3,899,600, Cl. 426-532.000.

Swidler, Ronald: *See—*
Brown, Louise H.; and Swidler, Ronald, 3,899,535.

Swingline, Inc.: *See—*
Young, Raymond R.; and Malcik, Frank J., 3,899,082.

Swiss Aluminium Ltd.: *See—*
Chaudhuri, Kiranendu B., 3,899,402.
Muhlhausser, Martin; and Roth, Christian, 3,899,723.

Sydow, Richard M. Spark plug adjusting tool. 3,898,829, Cl. 72-125.000.

Sylkhouse, Thomas E., to Dow Chemical Company, The. Calcium nitrate explosive composition. 3,899,374, Cl. 149-2.000.

Syoji, Masaaki; Ishihara, Goro; Hirose, Masao; Kubota, Hidenobu; and Mitani, Naoyuki, to Toray Industries, Inc. Continuous crystallization. 3,899,530, Cl. 260-525.000.

Systron Donner Corporation: *See*—
Morris, Harold D.; and Sigworth, Frederick J., 3,899,028.

Szasz, Kalman: *See*—
Jovanovics, Karolina; Szasz, Kalman; Fekete, Gyorgy; Bittner, Emil; Dezseri, Eszter; and Eles, Janos, 3,899,493.

Szczesniak, Raymond A., to E. R. Squibb & Sons, Inc. Method and apparatus for angiotensin I determination. 3,899,298, Cl. 23-253.00R.

Tabalba, Camilo Manansala, to International Standard Electric Corporation. Telephone subset circuit. 3,899,643, Cl. 179-81.00B.

Tadokoro, Tomoo; and Kawata, Masayuki, to Toyo Kogyo Co., Ltd. Exhaust gas purifying reactor. 3,898,802, Cl. 60-282.000.

Taguchi, Tatsuya; Uchiyama, Takashi; Nakamoto, Soichi; and Ito, Tadashi, to Canon Kabushiki Kaisha. Exposure control system in a photographic camera. 3,899,789, Cl. 354-30.000.

Tajkowski, Edward George, to Allied Chemical Corporation. Treated substrate for the formation of drop-wise condensates and the process for preparing same. 3,899,366, Cl. 148-6.160.

Takahashi, Masaoki: *See*—
Furuya, Shoji; Takahashi, Masaoki; and Matsushima, Masatoshi, 3,899,088.

Takahashi, Toru, to Canon Kabushiki Kaisha. Electrophotographic apparatus. 3,899,249, Cl. 355-10.000.

Takahashi, Toshiro; Nagano, Toshihiro; Aoshima, Yasuo; Suzuki, Matsuo; Suzuki, Shozo; and Asahina, Teruo, to Riken Light Metal Industries Co., Ltd.; and Kuboko Paint Co., Ltd. Method for producing coated and age hardened aluminum or aluminum-based alloy molded materials. 3,899,370, Cl. 148-159.000.

Takamune, Hirotoki; and Ishida, Fujio, to Citizen Watch Company, Limited. Battery-driven watch with battery consumption display alarm. 3,898,790, Cl. 58-23.0BA.

Takao, Hiroshi; Togawa, Kinmochi; Abe, Satoshi; and Nakagawa, Sigeyosi, to Nissan Motor Company Limited. Method of preparing ceramic structures. 3,899,555, Cl. 264-44.000.

Takeda Chemical Industries, Ltd.: *See*—
Kimura, Hiroshi; Kusakabe, Kensuke; Tokuda, Katsuhiko; Miyawaki, Masaru; and Nakatani, Hiromi, 3,899,480.

Tallow Company: *See*—
Brown, Louise H.; and Swidler, Ronald, 3,899,535.

Tamble, George D.; and Olsen, Frederick C., to Standun, Inc. Article positioning mechanism incorporating vacuum holding and pressure ejection. 3,899,087, Cl. 214-1.0BT.

Tanaka, Katsutoshi: *See*—
Tanaka, Shizuya; Ozaki, Toshiaki; Mine, Akihiko; Tanaka, Katsutoshi; Yamamoto, Sigeo; Ooishi, Tadashi; Hino, Naganori; and Satomi, Takeo, 3,899,582.

Tanaka, Kinji: *See*—
Cook, Elton S.; and Tanaka, Kinji, 3,899,589.

Tanaka, Morimasa, to Ichiko Industries Limited. Light reflector mold. 3,899,154, Cl. 249-117.000.

Tanaka, Shizuya; Ozaki, Toshiaki; Mine, Akihiko; Tanaka, Katsutoshi; Yamamoto, Sigeo; Ooishi, Tadashi; Hino, Naganori; and Satomi, Takeo, to Sumitomo Chemical Company, Limited. Aromatic imidocarbonate composition and method of use for combatting fungi. 3,899,582, Cl. 424-263.000.

Taniguchi, Tokuso. Lubricated catheter. 3,898,993, Cl. 128-349.00R.

Tank Sapp (UK) Ltd.: *See*—
Oiestad, Andrew, 3,899,099.

Tap, Henry H.: *See*—
Cappelle, Norman D.; Meyer, Walter; and Tap, Henry H., 3,898,879.

Tartakoff, Alexander; Gutta, John J.; and Griffin, Robert M., to GTE Sylvania Incorporated. Noise free incandescent lamp. 3,899,708, Cl. 313-315.000.

Tavazza, Giuseppe: *See*—
Robecchi, Edoardo; and Tavazza, Giuseppe, 3,899,014.

Taylor, David L.: *See*—
Petrovich, John P.; and Taylor, David L., 3,899,388.

Taylor, Edward: *See*—
Abram, Stewart J.; Denis, David R.; Heinze, Alex E.; Johnson, Leonard M.; and Taylor, Edward, 3,899,165.

Taylor, Frank E. Key ring. 3,898,825, Cl. 70-456.00R.

Taylor, John C. Fuel nozzle vapor return adaptor. 3,899,009, Cl. 141-59.000.

Taylor, Robert H.: *See*—
Malobicky, Rudolph L., Jr.; Perkins, James B.; and Taylor, Robert H., 3,899,241.

Taylor, Thomas L. Method of attaching teeth to an earth drilling tool. 3,898,895, Cl. 76-102.000.

Teal, Societe des Procedes L'Air Liquide et Technip de Liquefaction des Gaz Naturels: *See*—
Bourguet, Jean; and Gauberthier, Joseph, 3,898,857.

Tecnomare S.p.A.: *See*—
Magnanini, Umberto, 3,898,847.

TED Bildplatten Aktiengesellschaft: *See*—
Dannert, Dietmar; Ihlenburg, Rainer; Nackmayr, Dietrich; Goetze, Rudolf; Kruger, Wolfgang; Peter, Hartmut; Westphal, Klaus; and Thuy, Hans-Joachim, 3,899,181.

Tedden, Erhard. Method for automatically cleaning reusable foodstuff containers with reduced quantities of fresh water and chemicals. 3,899,348, Cl. 134-12.000.

Telesio, George O. Packer plate guide for refuse collection vehicles. 3,899,090, Cl. 214-82.000.

Temmler-Werke, Firma: *See*—
Oelschlager, Herbert; Matthiesen, Uwe; and Behrendt, Wilhelm A., 3,899,488.

Tenney, Robert I., to Ozone Incorporated. Control system for corona discharge ozone generating unit. 3,899,684, Cl. 250-535.000.

Tepper, Barry J.: *See*—
Rosette, Alan S.; and Tepper, Barry J., 3,898,955.

Terry, Stanley M., deceased; and by Third National Bank of Hampden County, executor, the, to Maremont Corporation. Extended range inductor alternator arc welder. 3,899,652, Cl. 219-133.000.

Tessler, Martin M.: *See*—
Rutenberg, Morton W.; Tessler, Martin M.; and Kruger, Leo, 3,899,602.

Testa, Phillip J.: *See*—
Gallaher, William C.; Stephens, Jerome P.; Testa, Phillip J.; and Wein, James E., 3,898,704.

Tetra Pak Developpement S.A.: *See*—
Stark, Sven Olof Soren; and Ljungberg, Per Allan, 3,899,112.

Texaco Inc.: *See*—
Cole, Edward L.; and Hess, Howard V., 3,899,398.

Texas Instruments Incorporated: *See*—
Daigneault, Theodore J., Jr., 3,899,765.
Shepherd, Glen C.; Allen, James B.; and Bryant, Samuel T., 3,898,860.

Textar GmbH: *See*—
Savary, Wolf; and Soennecken, Hartmut, 3,899,050.

Textron Inc.: *See*—
Richardson, Russell F., 3,898,833.

Thayer, John R., to Diamond Power Specialty Corporation. Plural motor control system for control rod drive mechanisms. 3,899,727, Cl. 318-564.000.

Theta Industries, Inc.: *See*—
Clusener, Gerhard R., 3,898,836.

Third National Bank of Hampden County, executor, the: *See*—
Terry, Stanley M., deceased; and Third National Bank of Hampden County, executor, the, 3,899,652.

Thomas, Robert. Tack fastener and stripper. 3,899,157, Cl. 254-18.000.

Thompson, John R., to Dresser Industries, Inc. Resin bonded diamond wheels with copper and silicon carbide fillers. 3,899,307, Cl. 51-298.000.

Thuy, Hans-Joachim: *See*—
Dannert, Dietmar; Ihlenburg, Rainer; Nackmayr, Dietrich; Goetze, Rudolf; Kruger, Wolfgang; Peter, Hartmut; Westphal, Klaus; and Thuy, Hans-Joachim, 3,899,181.

Tiger, Emil, to Bell & Howell Company. Microfiche reader-printer. 3,899,248, Cl. 355-5.000.

Timex Corporation: *See*—
Wuthrich, Paul, 3,899,700.

Tiner, Wayne Douglas: *See*—
Cox, Elmer Adrian; Tiner, Wayne Douglas; and Woods, Ritchey Paul, Jr., 3,898,776.

Tirelli, Paolo, to Atos Oleodinamica S.p.A. Fluid dynamic valve with direct electromagnetic control with slider-latching device. 3,899,003, Cl. 137-625.650.

Tiros Plastics Corporation: *See*—
Rigaud, Raymond L., 3,899,100.

Tobias, Philip E. Hole cutter device for graphic arts activity. 3,899,264, Cl. 408-14.000.

Toda, Toshimasa: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 3,899,464.

Togawa, Kinmochi: *See*—
Takao, Hiroshi; Togawa, Kinmochi; Abe, Satoshi; and Nakagawa, Sigeyosi, 3,899,555.

Tokico Limited: *See*—
Ohta, Yoshimoto, 3,899,217.

Tokuda, Katsuhiko: *See*—
Kimura, Hiroshi; Kusakabe, Kensuke; Tokuda, Katsuhiko; Miyawaki, Masaru; and Nakatani, Hiromi, 3,899,480.

Tokushige, Toshio; and Nagayasu, Motokiyo, to Sumitomo Chemical Company Limited. Process of baking or graphitizing carbon moldings. 3,899,575, Cl. 423-448.000.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Ichinose, Noboru; and Yokomizo, Yuhji, 3,899,451.

Tolle, Denver V. Fishing rod holder. 3,898,756, Cl. 43-21.200.

Tomita, Masao, to Yuasa Battery Company Limited. Thermal battery. 3,899,353, Cl. 136-83.00T.

Tomlinson, Frederica W. Combined tiara and earrings with detachable earring devices. 3,898,868, Cl. 63-2.000.

Tompsett, Michael Francis, to Bell Telephone Laboratories, Incorporated. Compensating reference voltage circuit for semiconductor apparatus. 3,899,694, Cl. 307-304.000.

Tong, Yang Hu: *See*—
Chou, Albert S.; Tong, Yang Hu; Medley, Harold C.; and Dalziel, Warren L., 3,898,814.

Tonnelli, Gerald J.; Epiling, Karol E.; and Ahrens, James R., to Production Data Inc. Auxiliary oil well tubing shut-off assembly. 3,899,024, Cl. 166-72.000.

Toray Industries, Inc.: *See—*
Aya, Toshihiko; Chiba, Kazumasa; and Izumi, Zenzi, 3,899,472.
Kajimoto, Tsunesuke; and Wakamatsu, Shigeru, 3,899,445.
Okazaki, Kaoru; Yagi, Kenkichi; Okamoto, Miyoshi; Watanabe, Koji; Hikota, Toyohiko; and Kubo, Masayoshi, 3,899,292.
Okazaki, Kaoru; Yagi, Kenkichi; Ichimura, Akira; and Masubuchi, Yoshinori, 3,899,623.
Syoji, Masaaki; Ishihara, Goro; Hirose, Masao; Kubota, Hidenobu; and Mitani, Naoyuki, 3,899,530.

Torcheux, Alain, heir: *See—*
Honore, Etienne Augustin Henri; Torcheux, Emile Leon Gabriel, deceased; Torcheux, Micheline Marie, born Deloffre, heir; Torcheux, Alain, heir; and Geret, Adeline, born Torcheux, heir, 3,899,769.

Torcheux, Emile Leon Gabriel, deceased: *See—*
Honore, Etienne Augustin Henri; Torcheux, Emile Leon Gabriel, deceased; Torcheux, Micheline Marie, born Deloffre, heir; Torcheux, Alain, heir; and Geret, Adeline, born Torcheux, heir, 3,899,769.

Torcheux, Micheline Marie, born Deloffre, heir: *See—*
Honore, Etienne Augustin Henri; Torcheux, Emile Leon Gabriel, deceased; Torcheux, Micheline Marie, born Deloffre, heir; Torcheux, Alain, heir; and Geret, Adeline, born Torcheux, heir, 3,899,769.

Torrington Company, The: *See—*
Elmore, J. Russell; and Benson, Carl F., 3,899,225.

Torrington Company, Limited, The: *See—*
Batt, Robert Stanley, 3,899,221.

Toth, John E.: *See—*
Chaparro, John J.; Ellis, Lowell V.; Meanor, Doyle W.; Morton, William D., Jr.; Richelmann, Bernd H.; Ross, George B.; and Toth, John E., 3,899,085.

Townsend Engineering Company: *See—*
Greider, Charles Austin, 3,898,923.

Toyo Boseki Kabushiki Kaisha: *See—*
Okamoto, Tsuyoshi; Kawaguchi, Yoichi; and Kai, Takayuki, 3,899,614.

Toyo Kogyo Co., Ltd.: *See—*
Tadokoro, Tomoo; and Kawata, Masayuki, 3,898,802.

Toyoda, Kenji, to Nippon Kogaku K.K. Light metering systems and exposure control systems for cameras. 3,899,788, Cl. 354-23.00D.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Morita, Minoru, 3,898,804.
Nakamura, Kenya; and Sato, Akira, 3,898,793.
Sasaki, Yoshio; and Morita, Minoru, 3,898,803.

Tracy, Charles W., to Apollo Plastics, Inc. Modular building panels and enclosures. 3,898,779, Cl. 52-264.000.

Tracy, James E.: *See—*
Peterkofsky, Alan L.; Tracy, James E.; and Schumacher, Paul M., 3,899,457.
Peterkofsky, Alan L.; Tracy, James E.; and Schumacher, Paul M., 3,899,458.

Trageser, James J., to United States Steel Corporation. Low balanced reactance delta closure for electric arc furnace transformers. 3,898,707, Cl. 13-12.000.

Traskos, Richard T., to Lith-Kem Corporation. Printing plate and method of making the same. 3,899,332, Cl. 96-33.000.

Tree-Mate Corporation: *See—*
Ulve, Gene A., 3,898,752.

Treece, William D.: *See—*
Dennis, Ronald E.; Treece, William D.; and Corsmeier, Robert J., 3,899,267.

Tressler, Charles J.: *See—*
Fischer, Valentine J.; Ponzoni, George Bernard; and Tressler, Charles J., 3,899,598.

Trifonov, Todor Kostov: *See—*
Alexandrov, Alexander Damyanov; Trifonov, Todor Kostov; Stefanov, Stefan Ivanov; Apostolov, Paskal Spasov; and Deshev, Mincho Borislavov, 3,899,021.

Trimble, David Carlaw: *See—*
Cobb, Douglas Romain; Holtz, Roger Edward; and Trimble, David Carlaw, 3,899,646.

Triplex Safety Glass Company Limited: *See—*
Ehlers, Robert, 3,899,316.

Trockel, Franz: *See—*
Coenders, Willi; and Trockel, Franz, 3,899,197.

Trube, Hans; Grimm, Hermann; and Karioth, Gernot, to Daimler-Benz Aktiengesellschaft. Air nozzle for venting systems. 3,898,921, Cl. 98-40.00A.

Tsao, Utah, to Lummus Company, The. Recovery of hydrogen chloride in an alkylation process. 3,899,545, Cl. 260-671.00R.

Tsuji, Heigo: *See—*
Maeda, Teruo; Shimoe, Hideo; Fujiwara, Yasuhiko; Aya, Norimoto; Marumo, Nagayuki; Tsuji, Heigo; and Sakamoto, Yuzo, 3,899,047.

Tucker, Robert B., Jr., to Continental Oil Company. Electronic wave analysis. 3,899,668, Cl. 235-193.000.

Turiot, Andre: *See—*
Masclet, Jean; and Turiot, Andre, 3,899,147.

Turner, John O.; and Deno, Norman C., to Sun Ventures, Inc. Acid-catalyzed decomposition of aliphatic hydroperoxides. 3,899,538, Cl. 260-593.00R.

Tyco Laboratories, Inc.: *See—*
Melmelstein, Seymour, 3,899,766.

Tyrolit-Schleifmittelwerke Swarovski K.G.: *See—*
Bogusch, Erich, 3,898,773.

Uchida, Teiji. Frequency modulator including a clapp-type oscillator. 3,899,755, Cl. 332-30.000.

Uchiyama, Takashi: *See—*
Taguchi, Tatsuya; Uchiyama, Takashi; Nakamoto, Soichi; and Ito, Tadashi, 3,899,789.

Ueba, Akio: *See—*
Shigemori, Hideto; Ueba, Akio; and Kitagami, Hisashi, 3,899,103.

Ueno, Yoshito; Kajitani, Mitsuo; and Ohgushi, Yoshio, to Nippon Electric Company, Limited. Pulse-frequency-modulation signal transmission system. 3,899,429, Cl. 250-199.000.

Uenoyama, Hiroshi: *See—*
Nozawa, Masao; Yasuno, Takehiko; Yamaguchi, Takashi; and Uenoyama, Hiroshi, 3,899,420.

Ulrich, Carl. Washing machine and door latch. 3,899,204, Cl. 292-336.300.

Ultrasonic Systems, Inc.: *See—*
Balamuth, Lewis, 3,898,992.

Ulve, Gene A., to Tree-Mate Corporation. Tree stump pulling machine. 3,898,752, Cl. 37-2.00R.

Unger, Harold: *See—*
Long, Raymond H.; and Unger, Harold, 3,899,399.

Unick, Alvin J.; and Gault, Kenneth W., to Ethyl Corporation. Method of metalworking utilizing a particular lubricant composition. 3,899,433, Cl. 252-52.00R.

Union Carbide Corporation: *See—*
Kordesch, Karl V., 3,899,354.

Union Oil Company of California: *See—*
Hansford, Rowland C., 3,899,441.

U.S. Amada, Ltd.: *See—*
Daniels, Dennis, 3,898,904.

United States of America
Aeronautics and Space Administration: *See—*
Burns, Raymond K.; Shure, Lloyd I.; and Katzen, Elliott D., 3,899,680.
Agriculture: *See—*
Berni, Ralph J.; and Harris, James A., 3,899,289.
Daigle, Donald J.; Pepperman, Armand B., Jr.; and Boudreaux, Gordon J., 3,899,618.
Daigle, Donald J.; Pepperman, Armand B., Jr.; and Vail, Sidney L., 3,899,619.
Friedrich, John P., 3,899,442.
Rothman, Edward S.; Hecht, Stephen S.; and Moore, Gordon G., 3,899,290.
Air Force: *See—*
Groff, Richard T., 3,898,910.
Army: *See—*
Bickman, Bernard F., 3,898,889.
Czerwinski, Watson P., 3,899,787.
Johnston, James V., 3,898,744.
Miller, Jacob I.; Dudley, Gaston E.; Blackwell, Philip A., Jr.; and Owens, Omer O., 3,899,497.
Rinaldi, Rose V.; and Wynn, James E., 3,899,357.
Energy Research and Development Administration: *See—*
Beckner, Everet H.; and Clauser, Milton J., 3,899,681.
Mailen, James C.; and Johnson, Wayne F., 3,899,296.
General Counsel-Code GP: *See—*
Dimeff, John, 3,899,252.
Haraway, William H., Jr.; Dale, Walter J.; and McErlean, Edwin A., 3,898,730.
Schuller, Fredrick T.; and Moore, Warren A., 3,899,224.
Interior: *See—*
Fukuta, Norikiko; and Paik, Young H., 3,899,129.
Hunter, Willard L.; White, Jack C.; and Stickney, William A., 3,899,569.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Honnell, Martial A. Isolated output system for a class D switching-mode amplifier. 3,899,745, Cl. 330-207.00A.
Shimada, Katsunori. Electric power generation system directly from laser power. 3,899,696, Cl. 310-4.000.
Webster, James A. Perfluoro alkylene dioxy-bis-(4-phthalic anhydrides and oxy-bis-(perfluoroalkyleneoxy-phthalic anhydrides. 3,899,517, Cl. 260-346.300.
National Aeronautics and Space Administration: *See—*
Prokopius, Paul R., 3,898,882.
Navy: *See—*
Allard, Frank L., 3,899,239.
Mandel, Louis; Ong, Algernon M.; and Singer, Paul, 3,898,984.
Marshall, Albert H., 3,898,747.
Stallworth, Lewis A.; and Hartley, Robert R., 3,898,878.
Stephenson, Andrew N., 3,899,145.
Werle, Donald K.; Kasparas, Romas; and Katz, Sidney, 3,899,144.
Transportation: *See—*
Fantasia, John F.; and Ingrao, Hector C., 3,899,213.

U.S. Philips Corporation: *See—*
Krainer, Erich, 3,898,732.
Otala, Matti Niilo Tapani, 3,899,780.
Rothgordt, Ulf, 3,899,035.
Saraga, Peter; and Wavish, Peter Roy, 3,899,771.

United States Steel Corporation: *See—*
Bowman, Howard J.; and Schindler, Donald G., 3,899,651.
Lauterbach, William L., 3,899,274.
Mester, Michael L.; and Whiteman, Frank L., 3,899,131.
Trageser, James J., 3,898,707.

Universal Oil Products Company: *See—*
Bauer, Carl F., 3,899,552.
Wagner, Melvin H., 3,899,302.

University of Chicago, The: *See—*
Levi-Setti, Riccardo, 3,899,672.

Unkauf, Manfred G.; Harris, Derek V.; and Gustafsson, Sven G., to Raytheon Company. FM Sidetone phase comparison system. 3,899,740, Cl. 325-349.000.

Unterstenhoefer, Leo; and Krieger, Wilhelm, to BASF Wyandotte Corporation. Process for preparing lightweight concrete. 3,899,455, Cl. 260-2.50B.

Untz, Robert W.: *See—*
Grawey, Charles E.; Untz, Robert W.; and Beyers, Marvin E., 3,899,220.

Upjohn Company, The: *See—*
Bonk, Henry W.; and Shah, Tilak M., 3,899,467.
Pharriss, Bruce B., 3,899,587.
Reymore, Harold E., Jr.; and Zane, John K., 3,899,443.
Schneider, William P., 3,899,526.

Uskokovic, Milan Radoje: *See—*
Grethe, Guenter; and Uskokovic, Milan Radoje, 3,899,498.

Utility Products (Proprietary) Limited: *See—*
Rivalland, Louis France; and McGarry, Aubrey Richard, 3,898,706.

Vail, Sidney L.: *See—*
Daigle, Donald J.; Pepperman, Armand B., Jr.; and Vail, Sidney L., 3,899,619.

Vaistub, Mikhail Efimovich: *See—*
Mendelevsky, Yakov Idelevich; Vaistub, Mikhail Efimovich; and Eglitis, Vilis Yanovich, 3,899,222.

Van Der Lely, Ary; and Bom, Cornelis Johannes Gerardus. Rotary harrows. 3,899,029, Cl. 172-50.000.

van der Lely, Ary; and Bom, Cornelis Johannes Gerardus. Soil compressing members. 3,899,030, Cl. 172-68.000.

van der Lely, Ary; and Bom, Cornelis Johannes Gerardus. Spreading implements. 3,899,138, Cl. 239-661.000.

Van Der Meulen, Douglas J.: *See—*
Frost, Charles C.; Van Der Meulen, Douglas J.; and Weis, Siegfried K., 3,898,888.
Frost, Ruben E.; and Van Der Meulen, Douglas J., 3,899,226.

Van Huisen, Allen T. Pneumatic-kinetic drilling system. 3,899,033, Cl. 175-97.000.

van Leuwen, Bruce G.; and Pitts, James J., to Olin Corporation. Stannous catechol derivatives and process for preparing them. 3,899,520, Cl. 260-414.000.

Van Nice, Robert I., to Westinghouse Electric Corporation. Interleaved winding for electrical inductive apparatus. 3,899,763, Cl. 336-70.000.

Van Nice, Robert I., to Westinghouse Electric Corporation. Four-strand interleaved-turn transformer winding. 3,899,764, Cl. 336-70.000.

Van Slyke, William Jan, to Battelle Development Corporation. Silver recovery process. 3,899,323, Cl. 75-83.000.

Van Vliet, Raymond August, to Weyerhaeuser Company. Continuous soft mat perforator. 3,898,711, Cl. 19-161.00P.

Vasilos, Thomas: *See—*
Sellers, David J.; Rhodes, William H.; and Vasilos, Thomas, 3,899,560.

Vaughan, Harry L.: *See—*
Lockwood, John C.; and Vaughan, Harry L., 3,899,286.

Vaughn, George A.; and Hargrave, Richard D., to Maark Corporation. Tennis racket having improved strength factor. 3,899,172, Cl. 273-73.00C.

Vaughn, Walter Lee; and Beam, Robert James, to Dow Chemical Company, The. Cellulosic materials internally sized with copolymers of alpha beta-ethylenically unsaturated hydrophobic monomers and ammoniated carboxylic acid comonomers. 3,899,389, Cl. 162-168.000.

VDO Adolf Schindling AG: *See—*
Arzi, Friedrich; Hofert, Paul; and Sudler, Roland, 3,898,789.

VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen: *See—*
Posselt, Heinz, 3,898,931.

Vereinigte Flugtechnische Werke-Fokker GmbH: *See—*
Renner, Eckhart; and Linnenbecker, Udo, 3,898,916.

Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Sigott, Siegfried; and Schwelberger, Hubert, 3,899,212.

Verschoore, Koen: *See—*
Evans, Albert Edward John; Aincough, Anthony Norbert; and Verschoore, Koen, 3,899,364.

Vetco Offshore Industries, Inc.: *See—*
Beaver, Ruby C.; Clasen, Theodor; Henning, Wolfgang; and Johnson, Emil S., 3,899,734.

VIA Gesellschaft fur Verfahrenstechnik: *See—*
Zander, Bernd; Borggrafe, Bernt; and Wortmann, Horst, 3,899,023.

Vibixa Limited: *See—*
Palmer, William Edward, 3,899,126.

Vickers-Zimmer Aktiengesellschaft: *See—*
Seidl, Anton, 3,899,562.

Vidberg, Marcel, to Automobiles Peugeot; and Regie Nationale des Usines Renault. Device for controlling the feeding of fuel to an internal combustion engine. 3,898,973, Cl. 123-198.0DB.

Vigo, Francesco M.: *See—*
Foley, Kevin M.; and Vigo, Francesco M., 3,899,524.

Vinje, Gunnar. Cable lock connector. 3,899,238, Cl. 339-245.000.

Viro, Felix: *See—*
Waxman, Burton Harvey; Shannahan, Robert Thomas; and Viro, Felix, 3,899,330.

Vlach, Anthony R. Golfer's training aid. 3,899,179, Cl. 273-183.00A.

Vock, Manfred Hugo: *See—*
Mookherjee, Braja Dulal; Vock, Manfred Hugo; Benaim, Carlos; and Shuster, Edward J., 3,899,597.

Volontieri, Aldo, to Alfa Romeo S.p.A. Method of eliminating risk of discharge of a battery in an electrical installation for a motor vehicle and an apparatus for effecting the same. 3,899,730, Cl. 320-61.000.

von der Elitz, Hans-Ulrich, to Hoechst Aktiengesellschaft. Process for the semi-continuous dyeing of synthetic textile articles. 3,899,291, Cl. 8-174.000.

von der Gonna, Rudiger: *See—*
de Ahna, Heinz-Dieter; and von der Gonna, Rudiger, 3,899,347.

Voytko, John D.: *See—*
Dixon, George D.; Davies, David H.; and Voytko, John D., 3,899,254.

VS-Schulmoebel Verwaltungs-GmbH: *See—*
Mueller, Falk, 3,899,207.

W. R. Grace & Co.: *See—*
Chi, Donald G.; and Lee, Hanju, 3,899,310.
Skov, Ebbe R.; Judge, Roderick B.; and Hemphill, Geoffrey, 3,899,588.

W. R. Gwace & Co.: *See—*
Shotbolt, Keith; Eastwood, Alan; and Gait, John Henry, 3,899,081.

Wadkin Limited: *See—*
Colton, Peter Malcolm, 3,899,724.

Wagner, John L.: *See—*
Rhodes, Timothy L.; and Wagner, John L., 3,899,169.

Wagner, Josef. Spray gun. 3,899,134, Cl. 239-332.000.

Wagner, Kuno; Dietrich, Werner; Kraft, Karl-Josef; and Conrad, Horst, to Bayer Aktiengesellschaft. Process for the production of synthetic plastics comprising urethane groups and biuret groups. 3,899,454, Cl. 260-2.5AT.

Wagner, Melvin H., to Universal Oil Products Company. Catalytic converter housing. 3,899,302, Cl. 23-288.00F.

Wagner, Richard C., to Hollymatic Corporation. Cryogenic refrigeration apparatus with automatic temperature control and automatic gas balance control. 3,898,863, Cl. 62-208.000.

Wahl Clipper Corporation: *See—*
Walton, William M., 3,899,654.

Waid, George M.; and Ault, Robert T., to Republic Steel Corporation. Low alloy, high strength, age hardenable steel. 3,899,368, Cl. 148-36.000.

Wakamatsu, Shigeru: *See—*
Kajimoto, Tsunesuke; and Wakamatsu, Shigeru, 3,899,445.

Wakamiya, Kinji; and Kobayashi, Isamu, to Sony Corporation. Integrated circuit with carrier killer selectively diffused therein and method of making same. 3,899,793, Cl. 357-48.000.

Walker, Edward J.: *See—*
Dennard, Robert H.; Rideout, Vincent L.; and Walker, Edward J., 3,899,363.

Wallace, Gary Leonard; Linehan, John J.; and Marshall, Robert Howard, to Chemetron Corporation. Feeding apparatus. 3,899,068, Cl. 198-27.000.

Wallis, Marvin E. Apparatus for extruding resin film with weakened tear lines. 3,899,283, Cl. 425-461.000.

Wallsten, Hans Ivar, to AB Inventing. Method of coating paper or other sheet material with surface layers of different coating compositions. 3,899,615, Cl. 427-211.000.

Walsh, Edward N., to Stauffer Chemical Company. Hydroxyalkylcarbamylalkylphosphonate flame retardants for polyurethanes. 3,899,453, Cl. 260-2.5AJ.

Walter, Gerald Joseph, to Pennwalt Corporation. Fluorinated phosphates. 3,899,484, Cl. 260-239.0EP.

Walton, Erlen Busch, to Eaton Corporation. Hydrostatic transmission control system. 3,898,812, Cl. 60-431.000.

Walton Products, Inc.: *See—*
Gobrecht, George W.; and Reed, Robert T., 3,899,084.

Walton, William M., to Wahl Clipper Corporation. Soldering iron tip assembly and cordless soldering iron embodying same. 3,899,654, Cl. 219-229.000.

Wandel u. Goltermann: *See—*
Harzer, Peter, 3,899,738.

Wanesky, William R., to Western Electric Company, Incorporated. Releasable mounting and method of placing an oriented array of devices on the mounting. 3,899,379, Cl. 156-80.000.

Wangco Incorporated: *See—*
Brown, Leon Henry, Jr., 3,899,794.

Ward, Benjamin F., to Westvaco Corporation. Process for making a methacrylic acid adduct of linoleic acid and product. 3,899,476, Cl. 260-97.500.

Ward, Edward B. Concrete form panels with hollow reinforcing ribs. 3,899,155, Cl. 249-189.000.

Ward, Raymond L. Fail-safe disengagement mechanism. 3,899,062, Cl. 192-129.00R.

Wardlaw, N. J. Removable mounted hoist for pick-up truck. 3,899,089, Cl. 214-75.00H.

Warner Electric Brake & Clutch Company: *See—*
Krug, William H., 3,899,061.

Warren, Brian Thomas; and Spicer, John William, to Miles Laboratories, Inc. 1-(2-substituted-chromonyloxy)-2-hydroxy-3-(substituted-phenoxy)propanes. 3,899,513, Cl. 260-345.200.

Wastenson, Erik Goran: *See—*
Lindskog, Per Folke; Arbstedt, Per Gunnar; and Wastenson, Erik Goran, 3,899,319.

Watanabe, Akinori: *See—*
Sasaki, Rentaro; Watanabe, Akinori; Ikegame, Mamoru; and Ogasawara, Tatsuo, 3,899,707.

Watanabe, Hideo. Automatic game block shuffling, aligning and table top arraying machine. 3,899,178, Cl. 273-136.00A.

Watanabe, Koji: *See—*
Okazaki, Kaoru; Yagi, Kenkichi; Okamoto, Miyoshi; Watanabe, Koji; Hikota, Toyohiko; and Kubo, Masayoshi, 3,899,292.

Watanabe, Kunitake, to Sony Corporation. Casette tape recording and/or reproducing apparatus having molded chassis and molded head carriage. 3,899,795, Cl. 360-137.000.

Watanabe, Naozo; Morizane, Kenji; and Ayabe, Masaaki, to Sony Corporation. Process for producing phosphides. 3,899,572, Cl. 423-299.000.

Watanabe, Teruji; and Ishihara, Hideo, to Kokusai Denshin Denwa Kabushiki Kaisha. Magnetic bubble transmission system using a rotating magnetic field. 3,899,781, Cl. 340-174.0TF.

Water Technology Service, Inc.: *See—*
Aber, Henry S.; Riggs, Dean D.; and Lamantia, John, 3,899,410.

Waterston, William, to G. Methven & Co., Limited. On-off flow control device and irrigation system incorporating same. 3,898,843, Cl. 61-13.000.

Watkins, Mervyn M. Universal manual drive for a wheeled vehicle. 3,899,189, Cl. 280-211.000.

Watkins, William L.: *See—*
Johnanson, Fred E.; and Watkins, William L., 3,899,559.

Watts, Ridley, Jr., to American Packaging Corporation. Package with tear element. 3,899,122, Cl. 229-41.00B.

Wavin B. V.: *See—*
de Putter, Warner Jan; and den Hertog, Willem Cornelis, 3,899,565.

Wavish, Peter Roy: *See—*
Saraga, Peter; and Wavish, Peter Roy, 3,899,771.

Wawra, Carl Martin, to Carl Schenck AG, Firma. Control input switching apparatus. 3,898,874, Cl. 73-90.000.

Waxman, Burton Harvey; Shannahan, Robert Thomas; and Viro, Felix, to GAF Corporation. Color screens for diffusion transfer processes containing color formers. 3,899,330, Cl. 96-3.000.

Weatherhead Company, The: *See—*
Baker, James P., 3,898,809.

Weaver, Francis James: *See—*
Esterson, Maurice; and Weaver, Francis James, 3,899,714.

Webb, William B. Inflatable arena structure. 3,898,775, Cl. 52-2.000.

Webster, James A.: *See—*
United States of America, National Aeronautics and Space Administration; and Webster, James A., 3,899,517.

Webster, William C.: *See—*
Minnick, Leonard John; Webster, William C.; and Smith, Charles L., 3,899,345.

Wehling, Rolf; and Neubert, Rolf, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Housing for open-end spinning turbine. 3,898,787, Cl. 57-58.890.

Wein, James E.: *See—*
Gallaher, William C.; Stephens, Jerome P.; Testa, Phillip J.; and Wein, James E., 3,898,704.

Weinstein, David, to Maryland Cup Corporation. Method of making package liners having starburst patterns cut therethrough. 3,898,899, Cl. 83-29.000.

Weis, Siegfried K.: *See—*
Frost, Charles C.; Van Der Meulen, Douglas J.; and Weis, Siegfried K., 3,898,888.

Werle, Donald K.; Kasparas, Romas; and Katz, Sidney, to United States of America, Navy. Powder contrail generation. 3,899,144, Cl. 244-136.000.

Werner, Peter; Drews, Ulrich; Rittmannsberger, Norbert; Busse, Wolfgang; Moder, Helmut; and Ohr, Karl-Heinz, to Robert Bosch G.m.b.H. Fuel-injection arrangement controlled in dependence upon the air inflow rate. 3,898,964, Cl. 123-32.0EA.

Wessling, Diether; Leister, Heinrich; and Degener, Eberhart, to Bayer Aktiengesellschaft. Certain benzazolylamino-anthraquinones. 3,899,504, Cl. 260-303.000.

Western Electric Company, Incorporated: *See—*
Montone, Liber J.; and Pietruszynski, Leonard J., 3,899,634.
Wanesky, William R., 3,899,379.

Westinghouse Electric Corporation: *See—*
Dixon, George D.; Davies, David H.; and Voytko, John D., 3,899,254.
Garey, Robert B., 3,899,199.
Goldstein, Norman P.; and Sun, Kuan H., 3,899,676.
Jackovitz, John F.; and Pantier, Earl A., 3,899,350.
Jones, Charles H., 3,899,767.
Luongo, Michael C., 3,898,842.
Morehead, Chalmers, 3,898,720.
Peterson, Noel C., 3,899,720.
Poole, Charles W., 3,898,938.
Putman, Thomas H., 3,899,216.
Stewart, Richard F.; and Gasparini, Francis A., 3,898,865.
Van Nice, Robert I., 3,899,763.
Van Nice, Robert I., 3,899,764.
Willard, Frank G.; and Farley, Earl T., 3,899,637.

Westphal, Klaus: *See—*
Dannert, Dietmar; Ihlenburg, Rainer; Nackmayr, Dietrich; Goetze, Rudolf; Kruger, Wolfgang; Peter, Hartmut; Westphal, Klaus; and Thuy, Hans-Joachim, 3,899,181.

Westvaco Corporation: *See—*
Ward, Benjamin F., 3,899,476.

Weyerhaeuser Company: *See—*
Van Vliet, Raymond August, 3,898,711.

Whirpool Corporation: *See—*
Knoop, Donald E.; Loessel, Marc C.; and Nystuen, Arne M., 3,898,875.

White, Allwyn M., to Automation Industries, Inc. Ultrasonic testing system for a test piece. 3,898,839, Cl. 73-67.80R.

White, Jack C.: *See—*
Hunter, Willard L.; White, Jack C.; and Stickney, William A., 3,899,569.

White-Westinghouse Corporation: *See—*
Draper, Robert, 3,898,977.
Millett, Bradburne L., 3,899,187.

Whitehead, Charles C. Knee protective gear. 3,898,697, Cl. 2-22.000.

Whiteman, Frank L.: *See—*
Mester, Michael L.; and Whiteman, Frank L., 3,899,131.

Wiebke, Gunter: *See—*
Benecke, Theodor; Wiebke, Gunter; and Pfannenschmidt, Carl, 3,899,320.

Wielicki, Edward A.: *See—*
Koch, Walter T.; and Wielicki, Edward A., 3,899,452.

Wiese, Delmar R., to Hoover Ball and Bearing Company. Door closing assembly for material handling systems. 3,899,095, Cl. 214-302.000.

Wikel, James H., to Eli Lilly and Company. 5-(2-Aminophenyl)pyrazole-3-carboxylic acids and esters thereof. 3,899,508, Cl. 260-310.00R.

Wild, Daniel: *See—*
Jones, Ivor; Muller, Hans Rudolf; Wild, Daniel; and Zafiropulo, Pitro Alois, 3,899,642.

Wild, Max; Schneider, Wolf-Dieter; Sennlaub, Friedel; and Winter, Rudolf, to Rheinstahl AG. Slide-proof bell and spigot joint for pipes and tubular elements. 3,899,183, Cl. 277-101.000.

Will, Fritz G.: *See—*
Farrington, Gregory C.; Will, Fritz G.; and Lord, Peter C., 3,899,352.

Willard, Frank G.; and Farley, Earl T., to Westinghouse Electric Corporation. Frequency shift keyed communications device. 3,899,637, Cl. 178-59.000.

Willdorf, Michael E., to Material Distributors Corporation. Security film for shatter-proofing windows. 3,899,621, Cl. 428-216.000.

Williams, Earl P.: *See—*
Lorenz, Donald H.; and Williams, Earl P., 3,899,471.

Williams, James L. Recirculating resin cleaning chemical feeder system for water softeners. 3,899,422, Cl. 210-108.000.

Williams, Laurence O., to Martin Marietta Corporation. Subliming solids bipropellant fuel system power generator. 3,898,798, Cl. 60-207.000.

Williams, Malcolm; Jones, Christopher Robin; and Crookes, Richard William, to C.A.V. Limited. Fuel supply systems for engines. 3,898,969, Cl. 123-139.00E.

Willner, David; and Crast, Leonard Bruce, Jr., to Bristol-Myers Company. Production of antibacterial agents. 3,899,394, Cl. 195-29.000.

Wills, Peter; and Pudlo, Zygmunt. Pneumatic actuators. 3,898,912, Cl. 91-1.000.

Wilmer, Reginald B.: *See—*
Matlock, Robert B.; Wilmer, Reginald B.; and Ferguson, Dale L., 3,898,783.

Wilson, Joan L., to Goodyear Tire & Rubber Company, The. 2-(Piperidinodithio)benzothiazoles. 3,899,460, Cl. 260-293.570.

Windmoller & Holscher: *See—*
Brinkmeier, Friedhelm, 3,899,385.

Winter, Alan William, to Bowater Packaging Limited. Moulding machines. 3,899,277, Cl. 425-383.000.

Winter, Gordon; and Adcock, J. O., to Lockheed Aircraft Corporation. Backup tool. 3,898,835, Cl. 72-465.000.

Winter, Rudolf: *See—*
Wild, Max; Schneider, Wolf-Dieter; Sennlaub, Friedel; and Winter, Rudolf, 3,899,183.

Wisconsin Alumni Research Foundation: *See—*
Chapman, Thomas W.; and Caban, Reinaldo, 3,899,570.

Witting, Harald L., to General Electric Company. Tapered helical compact fluorescent lamp. 3,899,712, Cl. 313-493.000.

Witzel, Bruce E., to Merck & Co., Inc. Aroyl substituted naphthalene acetic acids. 3,899,529, Cl. 260-517.000.

Wojaczek, Egon: *See—*
Plevak, Lubomir; Bekcer, Kunibert; Wojaczek, Egon; and Holken, Norbert, 3,898,845.

Wolber, Robert, to Gebruder Junghans GmbH. Electrically driven timers. 3,898,791, Cl. 58-28.00A.

Wolff, Ulrich: *See—*
Greubel, Waldemar; Krueger, Hans; and Wolff, Ulrich, 3,899,786.

Wood, Robert David, to Rolls-Royce Limited. Cooling arrangements for duct walls. 3,898,797, Cl. 60-39.660.

Woods, Ritchey Paul, Jr.: *See—*
Cox, Elmer Adrian; Tiner, Wayne Douglas; and Woods, Ritchey Paul, Jr., 3,898,776.

Woolf, Cyril: *See—*
Oxenrider, Bryce C.; and Woolf, Cyril, 3,899,563.

Wortmann, Horst: *See*—
Zander, Bernd; Borggrafe, Bernt; and Wortmann, Horst, 3,899,023.
Wragg, Reginald Trevor; and Yardley, James Frank, to Dunlop Limited. Method of producing rubber-plastics composites. 3,899,378, Cl. 156-73.500.
Wright, Robert: *See*—
Kelley, Wilson E., Jr.; and Wright, Robert, 3,898,997.
Wunder, Friedrich: *See*—
Fernholz, Hans; Wunder, Friedrich; and Schmidt, Hans-Joachim, 3,899,539.
Wuthrich, Paul, to Timex Corporation. Indexing mechanism for electric watch. 3,899,700, Cl. 310-37.000.
Wyant, Reece E. Method of grouting a pile in a hole involving the optimized frequency of vibration of the grouting material. 3,898,848, Cl. 61-53.520.
Wyant, Reece E., to Dresser Industries, Inc. Method of packing heat pipes within a pipe pile involving the optimized frequency of vibration of the packing material. 3,898,849, Cl. 61-53.520.
Wyant, Reece E., to Dresser Industries, Inc. Method of packing heat pipes within a pipe pile involving the optimized vibration of the packing material. 3,898,850, Cl. 61-53.520.
Wyant, Reece E., to Dresser Industries, Inc. Method of packing heat pipes within a pipe pile involving the vibration of the packing material. 3,898,851, Cl. 61-53.520.
Wynn, James E.: *See*—
Rinaldi, Rose V.; and Wynn, James E., 3,899,357.
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Bean, Lloyd F.; and Gundlach, Robert W., 3,899,329.
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Yamada, Koichi; Hashimoto, Tadanori; and Nakano, Kazuhiko, to Sumitomo Chemical Company, Limited. Method for the removal of organic substances from sodium aluminate solution. 3,899,571, Cl. 423-127.000.
Yamaguchi, Noboru: *See*—
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Yamaguchi, Takashi: *See*—
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Yamamoto, Shinzo, to Nihon Kensetsu Kikai Sangyo Kabushiki Kaisha. Earth tamper. 3,899,262, Cl. 404-133.000.
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Tanaka, Shizuya; Ozaki, Toshiaki; Mine, Akihiko; Tanaka, Katsutoshi; Yamamoto, Sigeo; Ooishi, Tadashi; Hino, Naganori; and Satomi, Takeo, 3,899,582.
Yamauchi, Masaaki, to Hitachi, Ltd. Colour picture tubes containing an in-line type electron gun assemblies. 3,899,761, Cl. 335-211.000.
Yamauchi, Seizo; and Shimomura, Kazuo, to Sanyo Electric Company, Ltd. Remote control signal generator which operates to individually control a plurality of controlled circuits. 3,899,773, Cl. 340-167.00R.
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Wragg, Reginald Trevor; and Yardley, James Frank, 3,899,378.
Yarnell, Charles Frederick, to Bell Telephone Laboratories, Incorporated. Carbon dioxide curing of plates for lead-acid batteries. 3,899,349, Cl. 136-27.000.
Yartz, Johnny W., to General Electric Company. Sheathed heating element installation. 3,899,658, Cl. 219-536.000.
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Yeager, Marvin Leo; Henschen, Homer Ernst; and Harwood, Robert George, to AMP Incorporated. Low insertion force cam actuated printed circuit board connector. 3,899,234, Cl. 339-74.00R.
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Yosim, Samuel J.; and Grantham, LeRoy F., to Rockwell International Corporation. Noble-type metal recovery process by use of molten salt bath. 3,899,322, Cl. 75-65.00R.
Youl, John Charles. Material handling apparatus. 3,899,094, Cl. 214-147.00G.
Young, James Whitehurst, to Dresser Industries, Inc. Pressure and volume compensating system for reciprocating oil field drilling tools. 3,898,815, Cl. 64-23.700.
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Yuker, Paul A. Chassis apparatus for all terrain vehicles. 3,899,037, Cl. 180-6.480.
Yum, Dooho; Mercola, Peter A.; and Jacobs, William R., to Beltone Electronics Corporation. Amplifier apparatus having combined DC and AC degenerative feedback. 3,899,742, Cl. 330-19.000.
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Oda, Osamu; Sakai, Kiyoshi; Yusa, Takashi; and Katano, Hamako, 3,899,525.
Zadrozny, Jan; Kobylinski, Lech; and Jaworski, Stefan. Sea-going high-commercial-speed displacement vessel. 3,898,946, Cl. 114-61.000.
Zaffaroni, Alejandro, to Alza Corporation. Biotransformable intrauterine device. 3,898,986, Cl. 128-130.000.
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Jones, Ivor; Muller, Hans Rudolf; Wild, Daniel; and Zafiropulo, Pitro Alois, 3,899,642.
Zander, Bernd; Borggrafe, Bernt; and Wortmann, Horst, to VIA Gesellschaft fur Verfahrenstechnik. Equipment for drying gas, in particular air, by refrigeration. 3,899,023, Cl. 165-111.000.
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Zaris, Louis. Simulated basketball game. 3,899,173, Cl. 273-85.00E.
Zenith Radio Corporation: *See*—
Chodil, Gerald J.; and De Jule, Michael C., 3,899,636.
Zetterberg, Gosta L.: *See*—
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Zientara, Donald; and Smith, Richard A., to Zwicker Knitting Mills. Cap having knitted crown and crocheted brim and method for making the same. 3,898,699, Cl. 2-192.000.
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Zohar, Rami, to Rami Art, Corporation. Interlocking construction elements. 3,898,761, Cl. 46-25.000.
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Zucker, Jerry, to Hudson Pulp & Paper Corporation. Tail tie system. 3,898,920, Cl. 93-1.100.
Zwicker Knitting Mills: *See*—
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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Altman, Gerald. Photographic products for direct observation and optical projection, and photographic processes for their production and utilization. Re. 28,515, Cl. 96-67.000.

Anderson, Gordon C.; and Page, John D., to Maremont Corporation. Spindle assembly. Re. 28,510, Cl. 57-88.000.

Avitzur, Betzalel. Shaping of hollow workpieces. Re. 28,511, Cl. 72-347.000.

Container Corporation of America: *See—*
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Eastman Kodak Company: *See—*
Lu, Chen-I; and Morrison, Edward D., Re. 28,516.

Enneking, Heinrich; and Jahrig, Gunter, to Industrie Werke Karlsruhe-Ausburg Aktiengesellschaft. Device for winding textile threads. Re. 28,514, Cl. 242-18.0DD.

Fletcher, Stephen H.: *See—*
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General Electric Company: *See—*
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Harms, Clarence L.: *See—*
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Hitachi Limited: *See—*
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Enneking, Heinrich; and Jahrig, Gunter, Re. 28,514.

Jahrig, Gunter: *See—*
Enneking, Heinrich; and Jahrig, Gunter, Re. 28,514.

Kinoshita, Haruo, to Yamaha Hatsudoki Kabushiki Haisha. Reciprocating piston type engines having weights for balancing primary inertial forces. Re. 28,512, Cl. 74-604.000.

Lu, Chen-I; and Morrison, Edward D., to Eastman Kodak Company. Polymeric rear projection screens. Re. 28,516, Cl. 428-213.000.

Maremont Corporation: *See—*
Anderson, Gordon C.; and Page, John D., Re. 28,510.

Morrison, Edward D.: *See—*
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Neebel, Richard R.; Harms, Clarence L.; Neebel, James D.; and Doerfer, Richard E., to Container Corporation of America. Loin pull and rib cut machine. Re. 28,508, Cl. 17-1.00G.

Nishimoto, Yukio: *See—*
Suzuki, Takaji; Wada, Sunao; and Nishimoto, Yukio, Re. 28,513.

Page, John D.: *See—*
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Piechocki, Benjamin, deceased; and by Fletcher, Stephen H., to Western Electric Company, Incorporated. Compensating base for leadframe bonding. Re. 28,509, Cl. 228-180.000.

Suzuki, Takaji; Wada, Sunao; and Nishimoto, Yukio, to Hitachi Limited. Apparatus for automatically testing pulmonary functions. Re. 28,513, Cl. 128-2.080.

Wada, Sunao: *See—*
Suzuki, Takaji; Wada, Sunao; and Nishimoto, Yukio, Re. 28,513.

Weiser, Earnest F., to General Electric Company. Filter-to-line transient isolator. Re. 28,517, Cl. 317-20.000.

Western Electric Company, Incorporated: *See—*
Piechocki, Benjamin, deceased; and Fletcher, Stephen H., Re. 28,509.

Yamaha Hatsudoki Kabushiki Haisha: *See—*
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Hegg, Thormod, to Paul Ecke, Jr. Poinsettia plant. 3,764, 8–12–75. Cl. 86.

Keefer, Ned, to Paul Ecke, Jr. Poinsettia plant. 3,761, 8–12–75. Cl. 86.

Nakano, Grace Y. Chrysanthemum plant entitled bronze pinnacle. 3,760, 8–12–75, Cl. 79.

Wandell, Willet N. White ash tree. 3,762, 8–12–75, Cl. 51.

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Airway Industries, Inc.: *See—*
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Allmand, John H. Vehicle attached push bumpers. 236,260, 8–12–75, Cl. D12—169.

Aquilante, Vincent J. Christmas tree. 236,272, 8–12–75, Cl. D29—1.

Bartz, Richard O.: *See—*
McAllister, Jack G., and Bartz. 236,277.

Bingaman, Dennis K. Light emitting optical fibre display. 236,279, 8–12–75, Cl. D48—20.

Boeing Co., The: *See—*
Coffey, Charles S., and Olson. 236,258.

Brown, Gordon M., to General Motors Corp. Rear fender for an automobile. 236,261, pub. 8–12–75, Cl. D12—196.

Burroughs Corp.: *See—*
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Coffey, Charles S., and J. J. Olson, to The Boeing Co. Hydrofoil craft. 236,258, 8–12–75, Cl. D12—66.

Corning Glass Works: *See—*
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Cunningham, Donald N. Bracket for a terminal housing of an electric strip heater. 236,251, 8–12–75, Cl. D8—230.

Dallimonti, Renzo, and S. J. Levinson. Control and display console. 236,268, 8–12–75, Cl. D26—5.

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Diwalt Industries Ltd.: *See——*
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Dussardier, Claude J., and J. G. Pousma, to C. A. Norgren Co. Combined filter and regulator for pressurized fluid. 236,263, 8–12–75, Cl. D23.

Dussardier, Claude J., to C. A. Norgren Co. Filter for pressurized fluid. 236,265, 8–12–75, Cl. D23—4.

Electromedics, Inc.: *See—*
Ray, Phillip E. 236,254.

Ficke, Norman F., to General Motors Corp. Vehicle display portable turntable. 236,257, 8–12–75, Cl. D12—55.

Ford, Douglas M., and R. C. Schluter. Golf practice device. 236,274, 8–12–75, Cl. D34—5.

Fredrick, William H., to Nathan Gilbert, ½ interest. Auxiliary display case. 236,246, 8–12–75, Cl. D6—130.

Fredriksson, Arne G. Pocketed leaf folder. 236,262, 8–12–75, Cl. D19—33.

Froehlich, Harry W. Combined dickey & bra. 236,242, 8–12–75, Cl. D2—211.
Froehlich, Harry W. Halter. 236,243, 8–12–75, Cl. D2—353.
Fude, Donald R., and V. A. Letter holder. 236,245, 8–12–75, Cl. D6—114.
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Hanna, Daniel C. Frame for overhead car wash unit. 236,282, 8–12–75, Cl. D49—12.
Hefner, Irvin V. Pickup truck liner. 236,259, 8–12–75, Cl. D12—156.
Hellman, Werner. Folding sled. 236,256, 8–12–75, Cl. D12—11.
Herczog, Andreq, to Corning Glass Works. Portable calculator. 236,271. 8–12–75, Cl. D26—5.
Holben, Clair D., to C. A. Norgren Co. Regulator for pressurized fluid. 236,266, 8–12–75, Cl. D23—21.
International Business Machines Corp.: *See*—
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Jacobson, James W., R. G. Clayton, and J. J. Sims, to Burroughs Corp. Case for a check encoder. 236,285, 8–12–75, Cl. D64—11.
Kemnitzer, Ronald B., to Sunbeam Corp. Facade for electric humidifier. 236,267, 8–12–75, Cl. D23—146.
Kilgore Corp.: *See*—
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McAllister, Jack G., and R. O. Bartz. Closed geometric structure. 236,277, 8–12–75, Cl. D34—15.
McCue, Daniel, to Rival Mfg. Co. Electrically powered meat grinder. 236,283, 8–12–75, Cl. D55—1.
McNair, Samuel L., to Dazey Products Co. Hand held power unit for massaging devices. 236,286, 8–12–75, Cl. D83—1.
McNair, Samuel L., to Dazey Products Co. Electrical vibrating back massager. 236,287, 8–12–75, Cl. D83—1.
McNair, Samuel L., and H. J. Talge, to Dazey Products Co. Manually held electric hair dryer. 236,288, 8–12–75, Cl. D86—10.
McNair, Samuel L., to Dazey Products Co. Electric hair cutting iron. 236,289, 8–12–75, Cl. D86—10.
McNair, Samuel L., to Dazey Products Co. Electric hair curling iron. 236,290, 8–12–75, Cl. D86—10.
McPhail, Kenneth J. Spinning toy. 236,278, 8–12–75, Cl. D34—15.
Michel, Leo, to Diwalt Industries Ltd. Barbecue. 236,247, 8–12–75, Cl. D7—107.
Miller, George E. Portable periscope. 236,284, 8–12–75, Cl. D57—1.
Norgren, C. A. Co.: *See*—
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Schurman, Peter T., to Plastic Forming Co., Inc. Storage and carrying case for video tape cassettes or the like. 236,291, 8–12–75, Cl. D87—10.
Sette, James J. Overcap for a pressurized container. 236,252, 8–12–75, Cl. D9—258.
Shu-Keung, Robert. Case for an electronic calculator. 236,269, 8–12–75, Cl. D26—5.
Sims, Jerry J.: *See*—
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Smith, Raymond P., Jr., to Craftsmaster, Inc. Electrical short circuit tester. 236,255, 8–12–75, Cl. D10—78.
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CLASS 58
23BA 3,898,790
23R 3,898,789
28A 3,898,791
39.5 3,898,792

CLASS 60
39.08 3,898,793
39.18R 3,898,794
39.28R 3,898,795
3,898,796
39.66 3,898,797
207 3,898,798
226R 3,898,799
227 3,898,800
247 3,898,801
282 3,898,802
305 3,898,803
323 3,898,804
325 3,898,805
330 3,898,806
391 3,898,807
403 3,898,808
404 3,898,809
413 3,898,810
421 3,898,811
431 3,898,812
525 3,898,841
653 3,898,842

CLASS 61
13 3,898,843
35 3,898,844
45D 3,898,845
46 3,898,846
46.5 3,898,847
53.52 3,898,848
3,898,849
3,898,850
3,898,851
72.4 3,898,852

CLASS 62
17 3,899,312
55 3,898,853
62 3,898,854
75 3,898,855
98 3,898,856
117 3,898,857
135 3,898,858
3,898,859
155 3,898,860
177 3,898,861
197 3,898,862
208 3,898,863
272 3,898,864
280 3,898,865
306 3,898,866
507 3,898,867

CLASS 63
2 3,898,868
15 3,898,869
18 3,898,870

CLASS 64
9R 3,898,813
22 3,898,814
23.7 3,898,815
29 3,898,816
30E 3,898,817

CLASS 65
3 3,899,313
23 3,899,314
3,899,315
106 3,899,316
135 3,899,317

CLASS 66
50B 3,898,818
87 3,898,819
195 3,898,820

CLASS 68
5E 3,898,821

CLASS 70
143 3,898,822
200 3,898,823
455 3,898,824

CLASS 71
90 3,899,318

CLASS 72
49 3,898,826
60 3,898,827
117 3,898,828
125 3,898,829
249 3,898,830
263 3,898,831
347 Re.28,511
389 3,898,832
391 3,898,833
453 3,898,834
465 3,898,835

CLASS 73
16 3,898,836
23.1 3,898,837
57 3,898,871
67.8R 3,898,839
67.8S 3,898,838
67.9 3,898,840
73 3,898,872
88R 3,898,873
90 3,898,874
116 3,898,875
117.3 3,898,876
151 3,898,877
151.5 3,898,880
181 3,898,878
3,898,881
194M 3,898,882
231R 3,898,883
339C 3,898,884
398AR 3,898,885
432R 3,898,886

CLASS 74
5.12 3,898,889
10.15 3,898,879
29 3,898,887
89.15 3,898,890
230.8 3,898,888
474 3,898,891
604 Re.28,512
710 3,898,892
859 3,898,893
866 3,898,894

CLASS 75
.5BA 3,899,319
33 3,899,320
49 3,899,321
65R 3,899,322
83 3,899,323
94 3,899,324
208R 3,899,325
214 3,899,326

CLASS 76
102 3,898,895

CLASS 81
72 3,898,896
114 3,898,897

CLASS 82
47 3,898,898

CLASS 83
29 3,898,899
152 3,898,900
343 3,898,901
378 3,898,902
387 3,898,903
404.2 3,898,904

CLASS 84
1.01 3,898,905

CLASS 85
11 3,898,906
64 3,898,907

CLASS 86
1A 3,898,908

CLASS 89
1.5F 3,898,909
14C 3,898,910

CLASS 90
11D 3,898,911

CLASS 91
1 3,898,912
31 3,898,913
375R 3,898,914
395 3,898,915
411R 3,898,916
488 3,898,917

CLASS 92
92 3,898,918

CLASS 93
1A 3,898,919
1.1 3,898,920

CLASS 96
1.5 3,899,327
3,899,328
3,899,329
3 3,899,330
3,899,331
33 3,899,332
48PD 3,899,333
48R 3,899,334
49 3,899,335
66R 3,899,336
67 Re.28,515
76C 3,899,337
115P 3,899,338

CLASS 98
40A 3,898,921
115R 3,898,922

CLASS 99
589 3,898,923

CLASS 100
12 3,898,924

CLASS 101
18 3,898,925
37 3,898,926
110 3,898,927
132.5 3,898,928
147 3,898,929
316 3,898,930
365 3,898,931

CLASS 102
66 3,898,932
92.7 3,898,933
100 3,898,934

CLASS 104
37 3,898,935
173 3,898,936

CLASS 105
61 3,898,937
215C 3,898,938

CLASS 106
2 3,899,339
39.6 3,899,340
57 3,899,341
65 3,899,342
72 3,899,343
99 3,899,344
118 3,899,345
288 3,899,346
299 3,899,347

CLASS 108
109 3,898,939

CLASS 111
1 3,898,940

CLASS 112
121.29 3,898,941
218A 3,898,942
262 3,898,943

CLASS 113
1F 3,898,944
120A 3,898,945

CLASS 114
61 3,898,946
71 3,898,947
91 3,898,948

CLASS 115
.1R 3,898,949
24.1 3,898,950

CLASS 116
119 3,898,951

CLASS 118
49.1 3,898,952
125 3,898,953
315 3,898,954
603 3,898,955
637 3,898,956
3,898,957

CLASS 119
3 3,898,958
51R 3,898,960

CLASS 122
32 3,898,961
250R 3,899,031

CLASS 123
32EA 3,898,962
3,898,963
3,898,964
75B 3,898,965
3,898,966
119F 3,898,967
122E 3,898,968
139AJ 3,898,970
139E 3,898,969
148CB 3,898,971
148E 3,898,972
198DB 3,898,973

CLASS 124
35A 3,898,974

CLASS 126
42 3,898,975
113 3,898,976
200 3,898,977
204 3,898,978
271 3,898,979
274 3,898,980

CLASS 128
2F 3,898,982
2N 3,898,983
2R 3,898,981
2.08 Re.28,513
2.1A 3,898,984
58 3,899,115
63 3,898,985
130 3,898,986
145.8 3,898,987
214R 3,898,988
232 3,898,989
283 3,898,990
303.14 3,898,991
334 3,898,992
349R 3,898,993
419PG 3,898,994
3,898,995

CLASS 131
136 3,898,996

CLASS 134
12 3,899,348

CLASS 136
27 3,899,349
29 3,899,350
34 3,899,351
83R 3,899,352
83T 3,899,353
86D 3,899,354
111 3,899,355
120FC 3,899,356
121 3,899,357
179 3,899,358
205 3,899,359
238 3,899,360

CLASS 137
113 3,898,998
512.1 3,898,999
561A 3,899,000
624.18 3,898,997
625.3 3,899,001
625.62 3,899,002
625.65 3,899,003

CLASS 138
89 3,899,004
106 3,899,005
109 3,899,006
114 3,899,007

CLASS 139
302 3,899,008

CLASS 141
59 3,899,009
250 3,899,010
325 3,899,011
331 3,899,012

CLASS 148
1.5 3,899,361
3,899,362
3,899,363
6.15R 3,899,364
3,899,365
6.16 3,899,366
6.24 3,899,367
36 3,899,368
108 3,899,369
159 3,899,370
171 3,899,371
187 3,899,372
3,899,373

CLASS 149
2 3,899,374
29 3,899,375

CLASS 152
208 3,899,013
353C 3,899,014

361FP 3,899,015

CLASS 156

73.5 3,899,377
3,899,378
80 3,899,379
181 3,899,380
204 3,899,381
327 3,899,382
394 3,899,383
433 3,899,384
521 3,899,385

CLASS 159

47R 3,899,386

CLASS 160

368G 3,899,016

CLASS 162

158 3,899,387
164 3,899,388
168 3,899,389

CLASS 164

52 3,899,017
82 3,899,018
201 3,899,019
286 3,899,020
306 3,899,021

CLASS 165

22 3,899,022
111 3,899,023

CLASS 166

72 3,899,024
117.5 3,899,025
302 3,899,026
3,899,027

CLASS 172

4.5 3,899,028
50 3,899,029
68 3,899,030

CLASS 174

40R 3,899,629
43 3,899,630
47 3,899,631
52R 3,899,632

CLASS 175

9 3,899,032
97 3,899,033

CLASS 176

19R 3,899,390
37 3,899,391
68 3,899,392
87 3,899,393

CLASS 177

151 3,899,034

CLASS 178

5.1 3,899,633
6.6A 3,899,035
6.8 3,899,634
7.3D 3,899,636
59 3,899,637
69.5TV 3,899,635

CLASS 179

2DP 3,899,638
2A 3,899,639
18DA 3,899,640
18EA 3,899,641
18J 3,899,642
81B 3,899,643
84R 3,899,644
90AD 3,899,645
170NC 3,899,646
189D 3,899,647

CLASS 180

5R 3,899,036
6.48 3,899,037
9.48 3,899,038
11 3,899,039
27 3,899,040
65R 3,899,041
82C 3,899,042

CLASS 181

33K 3,899,043
135 3,899,044

CLASS 182

121 3,899,045

CLASS 187

9E 3,899,046

CLASS 188

1C 3,899,047
16 3,899,048
18A 3,899,049
73.1 3,899,050
73.5 3,899,051
73.6 3,899,052
203 3,899,053
218XL 3,899,054
344 3,899,055
3,899,056
351 3,899,057

CLASS 192

13R 3,899,058
57 3,899,059
67A 3,899,060
84PM 3,899,061
129R 3,899,062

CLASS 193

35A 3,899,063

CLASS 194

9T 3,899,064

CLASS 195

28R 3,898,959
29 3,899,394
62 3,899,376
66R 3,899,395
80R 3,899,396
103.5 3,899,397

CLASS 196

129 3,899,420

CLASS 197

151 3,899,065

CLASS 198

7R 3,899,066
16MS 3,899,067
25 3,899,069
27 3,899,068
127R 3,899,070
232 3,899,071

CLASS 200

5R 3,899,648
61.51 3,899,649
148A 3,899,650

CLASS 201

2.5 3,899,398

CLASS 203

77 3,899,399

CLASS 204

33 3,899,400
59R 3,899,401
67 3,899,402
98 3,899,403
146 3,899,404
149 3,899,405
159.2 3,899,406
192 3,899,407
286 3,899,408
290F 3,899,409
302 3,899,410

CLASS 206

45.19 3,899,072
77.1 3,899,073
343 3,899,074
411 3,899,075
427 3,899,076
441 3,899,077
491 3,899,078
498 3,899,079
531 3,899,080

CLASS 208

66 3,899,411
92 3,899,412
138 3,899,413

CLASS 209

17 3,899,414
73 3,899,081
111.6 3,899,415
118 3,899,416
243 3,899,417
447 3,899,418

CLASS 210

22 3,899,419
96 3,899,421
108 3,899,422
152 3,899,423
169 3,899,424
206 3,899,425
387 3,899,426
521 3,899,427

CLASS 211

46 3,899,082

CLASS 212

14 3,899,083

CLASS 213

100R 3,899,084

CLASS 214

1BB 3,899,085
1BT 3,899,087
1Q 3,899,086
35R 3,899,088
75H 3,899,089
82 3,899,090
83.3 3,899,091
84 3,899,092
85.5 3,899,093
147G 3,899,094
302 3,899,095

CLASS 215

31 3,899,096
253 3,899,097

CLASS 219

67 3,899,651
113 3,899,653
133 3,899,652
229 3,899,654
404 3,899,655
413 3,899,656
523 3,899,657
536 3,899,658

CLASS 220

4B 3,899,098
88B 3,899,099
229 3,899,100
241 3,899,101

CLASS 221

6 3,899,102
10 3,899,103
197 3,899,104

CLASS 222

5 3,899,105
177 3,899,106
570 3,899,107

CLASS 223

51 3,899,108

CLASS 224

25A 3,899,109
42.1F 3,899,110
3,899,111

CLASS 226

90 3,899,112

CLASS 227

10 3,899,113

CLASS 228

55 3,899,114
110 3,899,116
122 3,898,729
180 Re.28,509

CLASS 229

5.5 3,899,117
17B 3,899,118
29F 3,899,119
32 3,899,120
34R 3,899,121
41B 3,899,122
3,899,124
41R 3,899,123
44CB 3,899,125
51TC 3,899,126
73 3,899,127

CLASS 233

32 3,899,128

CLASS 235

61.11D 3,899,659
103 3,899,660
150.2 3,899,661
3,899,671
151 3,899,662
151.32 3,899,663
3,899,664
153A 3,899,665
156 3,899,667
181 3,899,666
193 3,899,668

CLASS 239

14 3,899,129
102 3,899,130
123 3,899,131
199 3,899,132
265.39 3,899,133
332 3,899,134
534 3,899,135
3,899,136
545 3,899,137
661 3,899,138

CLASS 240

10.6R 3,899,669
10.65 3,899,670

CLASS 241

68 3,899,139

CLASS 242

18DD Re.28,514
18PW 3,899,140
46.4 3,899,141
67.1R 3,899,142
156.2 3,899,143

CLASS 244

3.13 3,899,145
16 3,899,146
102R 3,899,147
136 3,899,144

CLASS 248

43 3,899,148
75 3,899,149
145 3,899,150
429 3,899,151

CLASS 249

18 3,899,152
65 3,899,153
117 3,899,154
189 3,899,155

CLASS 250

199 3,899,428
3,899,429
3,899,430
301 3,899,213
328 3,899,673
352 3,899,674
369 3,899,675
390 3,899,676
474 3,899,677
484 3,899,678
3,899,679
496 3,899,680
502 3,899,681
532 3,899,682
3,899,683
535 3,899,684
536 3,899,685
555 3,899,686
568 3,899,687
576 3,899,688

CLASS 251

303 3,899,156

CLASS 252

8.5P 3,899,431
32.7E 3,899,432
52R 3,899,433
3,899,434
62.9 3,899,435
99 3,899,436
106 3,899,437
182 3,899,438
301.2P 3,899,450
311 3,899,439
371 3,899,440
411R 3,899,441
416 3,899,442
431C 3,899,443
455R 3,899,444
462 3,899,445
467 3,899,446
518 3,899,449
520 3,899,451
539 3,899,447
551 3,899,448

CLASS 254

18 3,899,157
194 3,899,158

CLASS 259

21 3,899,159

CLASS 260

2.5AJ 3,899,453
2.5AT 3,899,454
2.5B 3,899,452
3,899,455
18S 3,899,456
21 3,899,457
3,899,458
27BB 3,899,459
29.6HN 3,899,461
37N 3,899,462
45.7R 3,899,463
45.75S 3,899,465
45.8NZ 3,899,464
45.95L 3,899,466
47CB 3,899,467
67.5 3,899,469
67.6R 3,899,468
75S 3,899,470
80.73 3,899,471
80.78 3,899,472
92.8W 3,899,473
94.3 3,899,474
94.9B 3,899,477
97.5 3,899,475
3,899,476
156 3,899,478
3,899,479
209R 3,899,480
211.5R 3,899,481
3,899,482
231A 3,899,483
239EP 3,899,484
239.3A 3,899,485
239.6 3,899,486
240C 3,899,487
247.5EP 3,899,488
248NS 3,899,489
268TR 3,899,490
3,899,491
283SY 3,899,492
287P 3,899,493
287R 3,899,494
290HL 3,899,495
293.51 3,899,496
293.53 3,899,497
3,899,498
293.57 3,899,460
295AM 3,899,499
3,899,500
301 3,899,501
302SD 3,899,502
302H 3,899,503
303 3,899,504
306.8D 3,899,505
307D 3,899,506
309.6 3,899,507
310R 3,899,508
326.13 3,899,511
326.5FM 3,899,509
326.5M 3,899,510
343.2R 3,899,512
345.2 3,899,513
3,899,514
346.3 3,899,515
3,899,517
346.8A 3,899,516
348.5V 3,899,518
383 3,899,519
414 3,899,520
3,899,522
429.2 3,899,521
448.2D 3,899,523
448.8R 3,899,524
463 3,899,525
468D 3,899,526
488GM 3,899,527
488J 3,899,528
517 3,899,529
525 3,899,530
544F 3,899,531
544M 3,899,532
564G 3,899,533
567.6P 3,899,534
570.8R 3,899,535
576 3,899,536
591 3,899,537
593R 3,899,538
601R 3,899,539
621G 3,899,540
648F 3,899,541
658R 3,899,542
667 3,899,543
668C 3,899,544
671R 3,899,545
834 3,899,546
876R 3,899,547
932 3,899,548
3,899,549
977 3,899,550

CLASS 261

39A 3,899,551
44R 3,899,552
109 3,899,553

CLASS 264

41 3,899,554
44 3,899,555
3,899,556
65 3,899,560
81 3,899,557
104 3,899,558
115 3,899,559
151 3,899,561
210F 3,899,562
211 3,899,563
245 3,899,566
255 3,899,564
296 3,899,565
318 3,899,567

CLASS 267

152 3,899,160

CLASS 269

13 3,899,161
25 3,899,162
37 3,899,163
71 3,899,164

CLASS 270

54 3,899,165
83 3,899,166

CLASS 272

4 3,899,167
21 3,899,168

CLASS 273

1R 3,899,169
38 3,899,170
47 3,899,171
73C 3,899,172
85E 3,899,173
94R 3,899,174
102.1C 3,899,175
130R 3,899,176
134AD 3,899,177
136A 3,899,178
183A 3,899,179
183R 3,899,180

CLASS 274

1R 3,899,181

CLASS 277

96R 3,899,182
101 3,899,183

CLASS 280

11.13B 3,899,184
3,899,185
11.13W 3,899,186
11.35R 3,899,190
43.24 3,899,187
81A 3,899,188
150SB 3,899,191
154.5R 3,899,192
3,899,193
211 3,899,189
438R 3,899,194
481 3,899,195

CLASS 285

2 3,899,196
14 3,899,197
27 3,899,198
3,899,199
93 3,899,200

CLASS 292

25 3,899,201
216 3,899,202
335 3,899,203
336.3 3,899,204

CLASS 294

74 3,899,206
81R 3,899,205

CLASS 297

239 3,899,207
258 3,899,208
383 3,899,209
445 3,899,210
451 3,899,211

CLASS 299

75 3,899,212

CLASS 302

49 3,899,214

CLASS 303

21AF 3,899,215
21A 3,899,216
24C 3,899,217

CLASS 305

9 3,899,218
13 3,899,219
19 3,899,220

CLASS 307

117 3,899,689
215 3,899,690
223C 3,899,691
228 3,899,692
297 3,899,693
304 3,899,694
310 3,899,695

CLASS 308

3R 3,899,221
5R 3,899,222
10 3,899,223
121 3,899,224
174 3,899,225
187.1 3,899,226
237R 3,899,227

CLASS 310

4 3,899,696
8 3,899,697
9.5 3,899,698
13 3,899,699
37 3,899,700
40MM 3,899,701
67 3,899,702
103 3,899,703
183 3,899,704
235 3,899,705

CLASS 312

257R 3,899,228
319 3,899,229
3,899,230

CLASS 313

105 3,899,706
197 3,899,707
315 3,899,708
369 3,899,709
412 3,899,710
458 3,899,711
493 3,899,712

CLASS 315

34 3,899,713
39.51 3,899,714
39.61 3,899,715

CLASS 317

5 3,899,716
18D 3,899,717
20 Re.28,517
33R 3,899,718
101CC 3,899,719
101DH 3,899,721
101D 3,899,720
103 3,899,722
230 3,899,723

CLASS 318

162 3,899,724
227 3,899,725
472 3,899,726
564 3,899,727
687 3,899,728
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49 : 3,898,786
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51 : 3,898,698
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